ICRISAT Governing Board
Joint PC-TEC Meeting
10-11 March 2003
ICRISAT Patancheru, Andhra Pradesh, India

- **Proposal for the establishment of a Virtual University for the Semi-arid Tropics (VUSAT)**
- **Roundtable discussion on the establishment of VUSAT**
- **Feasibility study on the establishment of VUSAT**

Information Resource Management Office
ICRISAT

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Proposal for the establishment of a Virtual University for the Semi-arid Tropics (VUSAT)

Information Resource Management Office
ICRISAT

A Virtual University for the Semi-Arid Tropics*

Proponents: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
M S Swaminathan Research Foundation (MSSRF)

I. Introduction

A. Purpose

This paper proposes the establishment of a Virtual University for the Semi-Arid Tropics (VUSAT) to operate in succeeding phases in India, South Asia and sub-Saharan Africa. The SAT Virtual University aims to develop climate literacy and drought preparedness among rural communities, development workers, service providers, policy makers, and other strategic sectors through the integrated use of ICT, open distance learning, and other communication media. It will also communicate information on climatic trends like monsoon behavior and methods of drought management for community mobilization and disaster preparedness.

Likewise, this initiative will promote and explore the innovative interface of new tools (space technology, the Internet, satellite-based tracking of ground events, etc.) and conventional communication media (print, radio and television) for mass-based learning and social mobilization.

B. Backgrounder

Drought, especially in developing countries (like the one occurring in several states of India and Southern Africa), has resulted in untold economic dislocation, environmental damage, personal sufferings, hunger, and even deaths among large numbers of people. When drought occurs, farm communities are usually the first to be affected because of their heavy dependence on stored soil water. This can be rapidly depleted during extended dry periods. If rainfall deficiencies continue, even people who are not directly engaged in agriculture will also be affected by drought. This underscores the vulnerability of entire societies to this phenomenon.

On 19-21 November 2002, ICRISAT and CRIDA conducted a brainstorming workshop on coping strategies for drought management at ICRISAT. This activity came up with valuable recommendations from leading experts on the subject of drought. A major line of action was the initiation of a National Challenge Program on Drought Management. This was the offshoot of a recommendation by the Steering Committee for the Tenth Plan in Agriculture chaired by Professor M.S. Swaminathan on the organization of inter-disciplinary and inter-institutional challenge programs on agriculture and food security. This came about in anticipation of considerable hardships in severely drought affected states like Rajasthan from February to June 2003. A challenge program on drought management will hence be timely.

Upon the suggestion of Professor Swaminathan, one of the components of the National Challenge Program is the establishment of a Virtual University for Climate Management. The Virtual University will serve as a venue for developing climate literacy among the populace and for communicating information on monsoon behavior and methods of managing situations

Paper for the joint PC-TEC meeting, ICRISAT Governing Board, 10-11 March 2003, Patancheru, Andhra Pradesh, India. Some portions have been based from discussions with Professor MS Swaminathan, a feasibility study done by Professor Ram Takwale, a concept paper written by Vice Chancellor BP Sabale and recommendations of the roundtable discussion on the establishment of the VUSAT on 27 February 2003.

related to rainfall and water scarcity. The Virtual University is envisioned as a twenty first century institution capable of helping a broad range of stakeholders to leapfrog contemporary gaps in information and knowledge empowerment.

Related to the foregoing, another component will be the launching of a water literacy and capacity building movement aimed at making the conservation and sustainable and equitable use of water as everybody's business. It will also share information on successful coping mechanisms under conditions of severe drought, based on indigenous knowledge and modern science.

C. Rationale

To mitigate the effects of drought, there is an urgent need for a sustained information, education and social mobilization effort among strategic sectors of society, especially among the most vulnerable rural communities. This has been borne out of global experiences, including the OECD countries which have large areas that are drought-prone. The dictum "information is the backbone of drought preparedness" advocated by UNSO (2000) captures this perspective very well. Recent deliberations in the Science and Technology Committee of the UN Convention to Combat Desertification and Drought (October 2001) point to the importance of a communication strategy supporting all efforts to combat desertification and drought. Thus, a SAT Virtual University is the best venue for this massive effort. The SAT Virtual University can serve as a virtual university for climate management for the dry tropics.

Harnessing recent advances in information and communication technologies (ICT) combined with other communication media and open distance learning (ODL), the SAT Virtual University can inform, educate, and mobilize large numbers of people spread across big geographical areas about drought and climate management to cope better with drought.

Moreover, the SAT Virtual University's strategic use of communication media combined with ICT and distance learning will be a potent medium in linking policy makers, researchers, educators, service providers, and farm communities towards drought mitigation. These linkages will enhance information flows and make climate-related knowledge more accessible, enabling vulnerable communities to make better choices, articulate their needs, and empower them to have more control over their own destiny especially in times of emergency.

D. Nature and concept

This initiative adopts the concept and model of a virtual university proposed by the Commonwealth of Learning (COL). The concept of a virtual university is a consortium of institutions, enabled by appropriate ICT applications, working together in practical ways to plan programs, develop the required content and ensure the delivery of those programs and support services to learners. The COL analysis points out that a virtual university is not confined to delivering traditional services through new media and that there are unprecedented opportunities in enhancing open distance learning. From such a perspective, a virtual university has three broad features.

1. It is not a university in the conventional single institutional sense, but a seamless and virtual organization;
2. It will carry out its functions by optimizing ICT applications integrated with other communication media particularly those that enable the effective creation and delivery of demand-driven content based on targeted learning objectives.
3. It will add value to conventional on-campus instruction.

Based on the foregoing and on the vision, mission and contemporary task environment of ICRISAT, the SAT Virtual University is conceptualized to:

1. Be a modern, mass-based education, training and communication institution mobilizing a broad category of learners for drought mitigation and disaster preparedness;
2. Offer life-long learning opportunities to the poor, less-educated and illiterate people of the semi-arid tropics (the primary learners);
3. Complement and supplement open distance learning initiatives on agriculture and national open universities;
4. Sustain itself as a strong coalition of national and international information, knowledge and resource providers;
5. Attain financial self-sufficiency within five years, built on the paying capacity of secondary learners (rural service providers, local administrators, and policy makers), assisted by national and international development agencies.

II. Goal, objectives and functions

A. Goal and objectives

Combining new and conventional tools, the goal of SAT Virtual University is to build capacities and communicate information and knowledge related to drought, climate management and livelihood opportunities to mobilize stakeholders in the semi-arid tropics. This is ultimately aimed at empowering vulnerable people to make better choices and have better control of their own development, particularly during emergencies. Along this, the SAT Virtual University will pursue threefold objectives:

1. Educate and train a wide array of stakeholders in the dry tropics about drought mitigation, climate management and livelihood opportunities ;
2. Communicate relevant and timely information for community mobilization to mitigate the impact of drought; and
3. Establish and sustain a virtual network of policy makers, researchers, educators, service providers and farm communities towards effective drought mitigation and climate management.

B. Functions

1. *Content, curriculum and courseware development*- designing demand-driven curriculum and developing media-based course materials, including ICT-enabled distance learning modules on drought, climate management and livelihood options.
2. *Training, communication and community mobilization*- heightening awareness on climate management, building capacities for disaster preparedness and climate literacy, and developing skills on drought mitigation and livelihood opportunities to mobilize drought prone communities.
3. *Course delivery and learner support*- developing learning infrastructure network, delivering relevant course materials, and providing essential services like providing advisory, registration, handling learner queries, learner assessment and certification of performance.
4. *Documentation/impact assessment*- undertaking process evaluation and documentation; assessing the overall impact or the SAT University's programs.
5. *Network administration and management*– planning, coordinating, monitoring and evaluating programs and maintaining the virtual network of the SAT Virtual University coalition.

III. Operational scheme

A. The VUSAT coalition

Being a seamless virtual organization, the VUSAT will be made up of a coalition of international, national and state level research, development and educational institutions working with local ICT service providers, the private sector, CSOs and self-help groups. Operating initially in India, it will later on expand in South Asia (Bangladesh, Bhutan, Maldives, Nepal and Sri Lanka) and sub-Saharan Africa. The initial states and institutions invited to join the VUSAT coalition are as follows:

1. *Initial states and suggested focal institutions*

   - Andhra Pradesh- Government of AP, Andhra Pradesh Rural Livelihood Program (APRLP)
   - Karnataka- Drought Management Center
   - Madya Pradesh- Government of MP
   - Maharashtra – Office of the Agriculture Commissioner, Pune
   - Rajasthan – Office of the Chief Secretary, Jaipur
   - Tamil Nadu – MS Swaminathan Research Foundation (MSSRF)

2. *National organizations:*

   - Center for Research in Dryland Agriculture (CRIDA)
   - Department of Science and Technology (DST)
   - Indian Council for Agricultural Research (ICAR)
   - India Meteorological Department (IMD)
   - Indian Institute of Technology Mumbai
   - Indian Space Research Organization (ISRO)
   - ITC-International Business Division

3. *Open universities:*

   - BR Ambedkar Open University (BRAOU)
   - Indira Gandhi Open University (IGNOU)
   - Rajasthan Open University
   - Sri Lanka Open University
   - Yashwantrao Chavan Maharashtra Open University (YCMOU)

4. *Local organizations:*

   - Civil society organizations (CSOs)/interest groups/self-help groups
   - ICT/farm service providers

5. *International institutions:*

   - Commonwealth of Learning (COL)
   - Development agencies (ADB, DFID, EU, UNESCO, USAID, etc)
   - ICRISAT
   - International Water Management Institute (IWMI)

B. Intended learners

Focusing initially on non-formal education about climate management, the SAT Virtual University will cater to a broad category of primary and secondary learners. *Primary learners* will be drought-prone rural communities (farmers, women and climate managers), rural development workers, and service providers. *Secondary learners* will be knowledge generators, policy makers, state and district government officials, and rural development managers.

C. Content creation and management

The generation and management of content is a core function that will be the heart of the SAT Virtual University's operation. On the whole, this activity will be pursued in a phased fashion. During the initial stages, the focus will be on semi-subsidized courses generating awareness about drought mitigation and climate management. Within five years, these will be combined with tuition-based certificate, diploma, degree, and even research level courses on climate management and livelihood options.

Recent experiences in India indicate that the sustainability of ICT-enabled learning opportunities in rural and semi-rural areas is significantly dependent upon popular appreciation of the manner in which they fulfill local needs. To make communication and virtual education relevant and useful in the context of the SAT Virtual University, drought-related topics demanded by rural communities will be identified. The SAT Virtual University will spearhead such an approach with rural communities to meet their information and knowledge requirements and prepare them to cope with drought. These topics will be converged with the three-decade long research experience of ICRISAT and other national research agencies like ICAR-CRIDA in the semi-arid tropics. These will then be granulated and transformed into dynamic, learner-centered and demand driven formats. Content will be in two broad categories:

1. *Local:* Content based on community needs and interests towards higher farm productivity, cost-efficiency and marketability under varying levels of drought.

2. *Generic:*

- Literacy related to weather, climate, water and information technology.
- Global themes: content related to ICRISAT functions and research outputs.
- Global theme courses adopted from open and other universities.
- Other dryland agriculture and rural development related courses and activities from partner institutions.

These will be then granulated and transformed into dynamic, learner-centered and demand driven formats. Granulation, a new approach in non-formal learning pioneered by the COL, is particularly suitable to the VUSAT where a primary learners will come from non-traditional groups. Every granule is identified with a specific learning outcome so that even poor learners with limited time can derive knowledge. The granule will be designed in such a way that it can be lifted and combined with different courses. These will be stored in the SAT Virtual University's learning materials database to be made electronically accessible and distributed in various media to learners over the network. Towards this end, the following will integrated with learning content: (1) interactivities among experts and learners in textual and voice forms; (2) learner presentations, local experiences and content created by learners/communities; and (3) outcomes of seminars, workshops, lectures, etc.

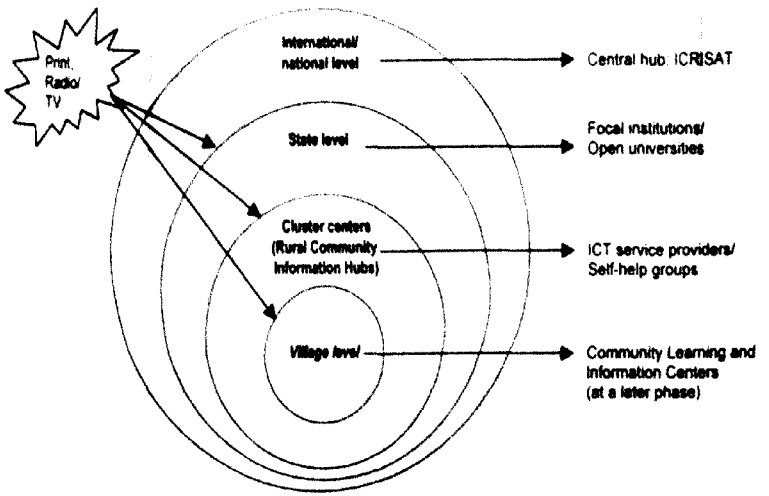
D. Instructional strategy, content delivery and access

The instructional media strategy will be an integrated combination of ICT, print and electronic media such as radio (terrestrial or satellite) and television. These will be supplemented by person-to-person interface with experts and trained community volunteers.

On the air, radio and television will be the primary media for instruction and information. Broadcast-based instructional modules will be delivered through the open universities involved in the consortium. Wherever feasible, satellite broadcasts will be downloaded and relayed to village learners. On the ground, the instructional and information infrastructure will be made up of a "hub-and-spokes" network spread across wide areas covered by the SAT Virtual University. In the context of India, the network will consist of a central hub located at ICRISAT, state hubs in each region participating in the program, and local hub for a cluster of villages. The local hub will be connected with Community Learning and Information Centers (CLICs) to be established in the villages.

An important feature of the design and operation of the cluster and village centers is gender sensitivity. The central hub will be developed, established and managed by ICRISAT, while the state agency and/or open university will establish and maintain the state hub. The local hub will be established by local institutions, organizations and entrepreneurs. The CLICs will be established by village institutions, CSOs and local entrepreneurs. There are a number of efforts in various states sharing information and delivering a variety of government services with rural families using contemporary ICTs. These efforts will be mapped and the spearheading organizations will be invited to join the VUSAT coalition.

Using the aforementioned network, the VUSAT will deliver content through three layers of actuators and service providers as shown below. The state partners will enter into arrangements with allied service providers to promote information hubs in rural clusters that can serve an adult population of about 15,000. The cluster centers will serve learners primarily in a group learning mode while delivering a number of information, communication and advisory services in the CLICs.



E. Network development and management

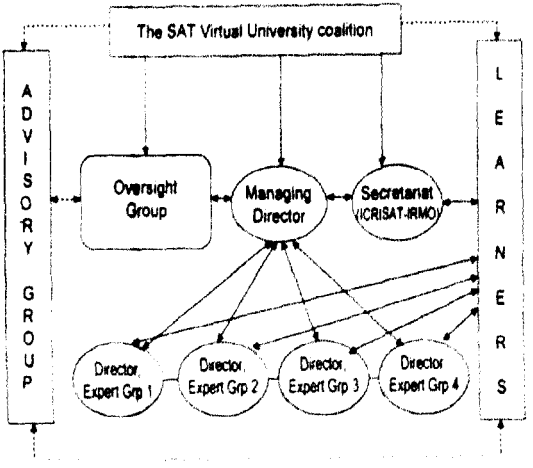
The VUSAT will upload information, knowledge and learning resources on websites and servers, then link them to learners by using Internet and other communication technologies like: broadband Internet, grid architecture and knowledge grid network, cable and wireless connectivity, and broadband satellite integrated with existing technologies such as print, radio and television. Developing and maintaining this network including its access by learners and communities will be a major function of the VUSAT. This will also involve developing and employing an appropriate learning/educational environment and making it accessible to every learner in the home or community.

F. Registration and certification

Learner registration and certification will be handled by the respective partner open university within the same geographical region. The certificate given to the learner should clearly refer to the SAT Virtual University as the awarding institution. While a major portion of the funds obtained through registration and certification will be maintained by the respective university, some pre-determined component will be shared with the VUSAT's core funds.

III. Organization and management system

In view of the concept, nature and major functions of the SAT Virtual University, a lean, flat and collegial organization and management (O&M) system is proposed below. Operating in virtual mode, the component O&M units (except the Secretariat) will not be confined to a singular space but spread and linked across the coalition. Details of responsibilities, powers and functions will be mapped out later.



A. ***Advisory Group.*** This will be the *principal academic authority* of the University entrusted with formulating measures related to content, curriculum and courseware development; content and curriculum delivery; training, extension and community mobilization; research; learner support services; and issues on copyright, intellectual property, accreditation and quality assurance. It will consist of world class academics, professors, educational researchers and technocrats from the public and private sector. Each partner institution will nominate a maximum of two persons to this Board. A chair will be elected by and from among the members with a term of three years with renewal. All recommendations made by this Group will be deliberated by the Oversight Group for its final approval prior to implementation.

B. ***Oversight Group.*** This will be the *apex authority* of the university, entrusted with *policy-making and management oversight*. The members of the Oversight Group (OG) will be the heads of each partner institution in the coalition. The Board will have a revolving chair to be elected by and from among the members with a duration of three years with extension. A Managing Director will also be made an *ex-officio* member of the OG. Upon recommendation by the Managing Director, the OG will also appoint Directors and members of four expert groups (quality circles) from among the coalition staff dealing with.

1. Content, curriculum and courseware development
2. Training, communication and community mobilization
3. Content delivery and learner support
4. Documentation and impact assessment

Each circle will consist of experts and representatives selected from partner institutions. Directors will be responsible in planning and executing the functions entrusted to their respective circles.

C. ***Managing Director:*** The Managing Director (MD) will be the highest academic and executive officer of the SAT Virtual University. Nomination and appointment to this position will be made by the OG. The proposed term of office of the MD is three years with renewal. Detailed at ICRISAT-IRMO, the MD will be supported by two technical staff to be also detailed by partner institutions in the coalition.

D. ***Secretariat:*** The ICRISAT Information Resource Management Office (IRMO) will initially serve as the official secretariat of the University. The Secretariat will provide overall support to the MD especially on project planning and development, public awareness, network/hub management, software development, networking and advocacy, coalition administration and finance.

IV. Resource generation and mobilization

A. Seed Fund

Each partner institution in the coalition may contribute an initial amount for a seed fund to start the operations of the SAT Virtual University. Possibly, a voluntary investment of US$10,000 by each partner institution may serve as a starting point which will be lodged at ICRISAT. Upon its launching, an endowment fund may be established by the coalition to sustain the University especially during its initial years. Grant assistance from international donors will also be solicited for the seed fund through aggressive marketing. The donor network of ICRISAT, MSSRF and COL will be harnessed for this purpose. As the University will implement tuition-based courses, a certain proportion of learner fees received by way of registration charges,

course materials, assessment and certification, will be used to meet its operational expenditures.

B. Self-sustainability

Sustainability will be considered from four perspectives:

1. *Financial:* generating sufficient and stable financial resources to make all operations self-supporting.
2. *Educational:* offering adequate education, training and communication programs to meet learner needs.
3. *Technological:* generating appropriate learning infrastructure and strong local expertise that ensure continuous operations, maintenance and upgrading.
4. *Socio-economic:* generating a wide array of activities with the people and learner groups (for learning, working, developing, offering-marketing products and services, etc.) to optimize the use of the VUSAT's facilities.

Over time, the SAT Virtual University will be sustained through the financial resources it will generate not only at the university level, but also at the state hub, local hub and village levels. It is envisioned that the SAT Virtual University will become self-sustaining within five years if various partners and donor agencies share initial development costs. Based on experiences of open universities in India, the VUSAT's financial sustainability can be attained through the extensive utilization of the infrastructure and learning environment it creates, richness and relevance of the courses and services it offers, economies of scale it achieves and wider applicability of its network and programs.

The following income sources will eventually sustain the VUSAT:

1. Core contributions from founding members
2. Membership fees from users
3. Tuition fees for courses and training programs
4. Certification/examination fees
5. Network participation fees from local ICT providers
6. Expert service fees for personalized /customized and charged services provided by the VUSAT network
7. Advertisements

The following strategies are proposed for the VUSAT's self-sustainability:

1. Maintain a core fund out of the contribution of partner institutions in the consortium.
2. Generate income from courses for secondary target groups to meet operational and developmental costs.
3. Make courses for primary target groups to be eventually self-supporting.
4. Solicit funding support for pro-poor programs from central/state governments and international development agencies to subsidize community education and social mobilization programs.
5. Forge partnership with the Indian UGC to support community-oriented courses. Developing e-learning content is a major activity of the UGC.
6. Generate resource support from private corporate bodies like Infosys, Reliance, Wipro, and other firms interested in promoting ICT4D to subsidize mass education and social mobilization programs in drought prone rural areas.
7. Organize expert services for quality and value addition for national and international marketing.

V. Expected outputs and outcomes

A. The SAT Virtual University is expected to come up with the following outputs:

1. Trained community volunteers, farm families, development workers, and service providers on all aspects of drought mitigation and climate management;
2. Computer-based distance learning modules on drought mitigation, best practices and livelihood options under drought, and disaster preparedness;
3. Multi-media information and education materials on drought and climate management;
4. Regular updates on weather and climatic trends; and
5. Public policy options and advisory on drought mitigation and climate management.

B. The establishment of the SAT Virtual University is expected to have the following outcomes.

1. Empowered rural communities with abilities to forecast, prepare, manage, and mitigate drought;
2. Mobilized and learned social infrastructure for drought mitigation and climate management;
3. Improved and sustained farm productivity and livelihood opportunities among vulnerable communities in times of drought;
4. Enhanced information and knowledge flows among stakeholders on climate management;
5. Informed policies on climate management and drought mitigation; and
6. Minimum adverse economic, environmental, and social effects of drought to vulnerable communities.

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Roundtable discussion on the establishment of VUSAT

Information Resource Management Office
ICRISAT

Roundtable Discussion on SAT Virtual University (VUSAT)*

The roundtable discussion, held on Thursday, 27 Feb 2003, began with brief introductory speeches by Director General Dr William D Dar and Prof MS Swaminathan. This was followed by a presentation by Prof Ram Takwale of the feasibility study he conducted on the setting up of the VUSAT. The topic was then opened for discussion among the participants, moderated by Prof Swaminathan.

Dr Dar: Welcome all participants. The common denominator that brings us here today is an ever-worsening problem that affects everyone – poor rural people and their crops and animals: drought. Having focused on crop improvement and watershed management during our 30-year long existence, we find that drought is an ever-recurring problem in the dry tropics. In AP, rural people are facing the consequences of the worst-ever drought and severe water shortage in recent years. AP Governor Dr Bamala, in his maiden address to the House, spoke on the highly devastating impact of drought and the consequent water and fodder shortage. He painted a grim picture: rainfall deficit was 32% and kharif-sown area has shrunk by 20 lakh ha. Fodder shortage is expected to be 35 lakh tons. Ninety percent of villagers were declared drought-affected. Rs. 342 crore was released for drought relief and Rs.300 crore contingency plan for drinking water supply was prepared. This problem occurs in most parts of India and Asia and even in sub-Saharan Africa. There is widespread international acceptance of the pivotal role of information and knowledge in mitigating and managing drought. The UN has said that information is the backbone of drought preparedness.

The virtual university will take the right information to the right people at the right time using new and conventional communication tools. From our pilot project on developing an ICT-enabled distance-learning module at Adakkal village in AP, ICRISAT is taking lessons in partnership with various institutions. There is so much to learn from the experience, particularly coping with this problem. We were inspired by Dr MSS to set up the VUSAT and the Commonwealth of Learning has given ICRISAT tremendous support. With your support, the VUSAT will be our major channel of sharing timely information and knowledge on drought mitigation and management.

We are grateful to Prof Takwale for preparing the feasibility report. Dr Dar presented the idea of the VUSAT at the Philippines. The idea was received with tremendous enthusiasm by Secretary of Agriculture and they have already set up a team to look into the matter.

Prof MS Swaminathan (MSS): The setting up of the VUSAT is a timely initiative. The full impact of the serious drought of last year will be evident in the next few months, which are going to be very difficult. Humans, cattle and crops need water. There was ample knowledge in the country that could have mitigated the effects of the severe drought of '78-79, if only everyone had access to it. The country is data-rich and rich in knowledge on contingency planning, alternative cropping strategies, methods of minimizing effects of drought, etc., but the knowledge remains unshared. Thus, the first form of defined digital divide is not actually between rich nations and developing countries, but within a country. There are people who have access to the best possible medical help and others who have no medical help at all. Thus, barriers to sharing knowledge within the country should first be broken down.

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* Background paper for the joint PC-TEC meeting, ICRISAT Governing Board, 10-11 March 2003, Patancheru, Andhra Pradesh, India.

Mahatma Gandhi said that the worst form of brain drain taking place in India is not that of people emigrating to other countries, but that of educated rural people moving to urban areas. How do you bridge this technology gap within rural India among underprivileged communities? Reaching the unreached – dialog begun in 1991 – included biotechnology that led to biovillages and IT that led to rural information and knowledge centers. The Antyodaya approach – starting from the last person to bridge the digital divide – is needed. There should be social inclusion in technology dissemination. We should have a win-win situation for all.

The VU for Agrarian Prosperity launched in Maharashtra aims to reach 1 crore 10 million farmers in about 50,000 villages within 2 years. Thus, the need of the moment is to take knowledge to those in rural areas and help them implement it. How do we take the SAT technology developed by institutes like ICRISAT and CRIDA to villagers in an assimilable and user-friendly form? This is what we call value-addition to generic information: converting generic information into location-specific information and adding a dynamic aspect to it. The content is most important, although delivery is also exceedingly important. The content provided should have meaning to people receiving it, otherwise, it will be rejected. People will accept and value tools of technology that make sense to them and will pay to use them. In the VUSAT consortium, data providers, data users, information managers, donors and funding agencies, as well as a strategy for sustainability are all important. Financial viability is equally important. Sustainability in terms of management, information flow and financial viability should all be discussed.

The time has come in India to break departmental barriers, pool knowledge and take it to the people who need it most in a valuable form that can be implemented. We have seen that if informational knowledge makes a real change to their lives, rural people take to it like fish to water. Modern technology is absorbed by all – women, semi-literate or literate – and they make use of what they learn.

Roundtable Discussion

The discussion was divided into four main areas: nature and concept of the VUSAT, content creation and management, delivery of the content and organization (in terms of funding, roles of various partners and structure).

Nature and concept of the VUSAT

Primary targets: The main priority of the VUSAT is to reach poor and vulnerable communities and to produce graduates who can add value to the economy and create jobs, rather than being unemployed. The exact nature of the clientele and their needs should be very clear – they are mainly illiterate and semi-literate men and women. Here we will have diverse clientele consisting of farmers, whose needs are very different.

The target group being considered is very diverse. ICRISAT and other participants are generally more at ease dealing with a particular type of client who is literate and fairly uniform in the distance education mode or OU mode, or people like policymakers, so the VU must take care not to lose focus of the primary target group. It was suggested that for the first 2 years, rural communities (RCs) should be the only target group. This can later be extended to include others. They should also be careful not to replicate work that has already begun. Instead, existing systems should be brought together to stay one step ahead. A participant from APRLP felt that the VUSAT should not be over-publicized until some work is completed and in place. Also, it must be kept in mind that hardware and software become obsolete every few years, so resources should be available to update these and equip the VUSAT for the future. Others felt that VUSAT can create its own market in the RC and should publicize its venture.

Dr Ti of the FAO said that the FAO has always been involved in training trainers and policymakers. The VUSAT initiative could be a great leap forward in rural development. However, enormous resources will be required and these should be discussed. We should have teachers who can spread the word.

Nature of the VUSAT. An Open University (OU) or virtual university (VU) is a degree-granting system but VUSAT will focus more on nonformal education and rural development. It can continue working with the OU system but it will work differently. The VUSAT will be complementing the OU system to empower rural communities, but it will also deal with policymakers, scientists, and trainers. Most OUs have focused on the service sector, so the shift to the rural communities (RCs) is welcome. Content is very important and more important is its delivery to marginalized society. A continuous evaluation system needs to be built into the program.

Many organizations are providing advice on coping with drought on a year-to-year basis or the short-term, whereas the VUSAT is thinking of a long-term role where they are trying to develop skills and knowledge to meet the challenge of drought at the grassroots level. This subtle difference must be kept in mind when drought mitigation programs and VUSAT are discussed.

One participant raised the point that the name *Virtual University* might not mean much to RCs. He suggested a more localized name that will communicate something to them and have some meaning for them. Dr MSS said that they could probably retain the general name VUSAT but use a local name in the language of each region (in Tamil for Tamil Nadu and so on).

Content creation and management

The end-user should be kept in mind when creating content. Creating a knowledge base to meet the needs of a variety of end-users is a big challenge. The information system should be useful at farm level. Content must be demand-driven and valuable so that people will use and pay for it. If content is supply-driven it may not be used at all. Training should be a market-driven skill – the need should be identified and training provided to cater to it. As for taking knowledge to the target group, the VUSAT cannot stop at only knowledge, as this will cause the RCs to become frustrated and cynical. They need help to implement and use the knowledge practically. Thus, VUSAT must enter partnerships with not just knowledge groups, but more importantly, with development agencies. A considerable degree of local involvement is required. A sense of ownership should be inculcated among the RCs.

A key issue is how can content be localized, especially when VUSAT will be dealing with large numbers of diverse communities and people?

Most ODL courses are aimed at job opportunities or additional training such as language training. VUSAT needs to create courses that will help raise the income of the poor. The learner should understand course content so that he will continue with further courses.

One suggestion was that rather than drought and climate management, climate preparedness should be imparted. Course content should focus on worst-case management and teach villagers how they can manage their resources. Worst-case scenarios should be monitored and shared resources like feed, fodder and water banks encouraged. Prof MSS responded to this suggestion by saying that various scenarios could be created and learners taught how to manage in each case: anticipatory management. Detailed information already exists for various scenarios but will have to be tailored to fit the situation.

The literacy levels of the learner should be looked at, as more advanced delivery systems can be used when learners are literate. When audiovisual output is designed, the content provider should start from the customer, his needs and his profile (such as when and how he is most likely to access the information). Inputs should be made entertaining, with media presenters for the local scene and examples drawn from the learners' daily lives, which they will be able to identify with.

For mass programs, all stages need to be looked at, including design and development. So much is being done in so many places, a resource pool of all available information should be built up and then decisions taken about what can be converted to audiovisual mode. The information granules need to be customized to peoples' specific needs and problems. It is also exceedingly important to include traditional/indigenous knowledge obtained from the farmers.

VUSAT should not get into the teacher and taught mode. Instead there should be case studies, that is some examples of people who successfully coped with drought and some that failed and why. Such cases in the local languages, in the form of stories and even visuals that may help the farmer identify certain problems such as specific pests, etc., would be important.

Emphasis should also be given to alternate vocations and means of livelihood that can be adopted by the farmers in times of drought. What are the common pool resources available and can they be used to generate some income? There is a lot of emphasis on feed resources in our country and a lot of alternate feed resources that are under exploited. How to treat these, store them and keep livestock alive during the course of the drought are the type of lessons that should be imparted by the VU.

Beyond climate management, a number of other programs could be introduced, such as water literacy, land and water resource management, biodiversity management and marketing management.

Conventional content, teaching and examination methods should be avoided. The objective should be achievement – in what way the knowledge has helped or is being used. Objectives should be different, measures of evaluation have to be changed and therefore teaching methods should be changed. NGOs and entrepreneurs should be VUSAT partners at the community level. It will be issue-based, problem-based education. The first exercise will have to be one of literacy – water literacy, weather literacy, IT literacy, etc. Can courses be designed that are problem-based, user-based, and application-based? Applications should be appropriate to the rural people who are the main target groups.

An expert who understands the situation correctly should properly customize advice. Technology is moving towards customization. We are trying to find green tools where the farmers' inputs should be able to give a complete picture of his situation. This would enable the expert to make certain appropriate suggestions. Such tools must be developed. That will be the basic approach to customize IT technology. VUSAT would also need to identify self-contained units of land where specific information can be applied or markets set up.

The issue of registration and certification was discussed but it was suggested that this is an issue that can be considered later in the exercise. Can a student decide which university (national or state universities) he wants the certificate from? What about other countries like Sri Lanka and Bhutan? Where do they come in? At present, data provision is restricted to India. Ideally, a student should be able to choose courses from various Universities and get a certificate from one of these. It should not matter where the degree comes from if the learners can access course content customized to their needs. The VUSAT is looking at farmers' needs, so their local universities will come into the picture on behalf of the

consortium. It was suggested that the VUSAT begin with some sort of activity and after a year, discuss the issue of certification. It will be called a noncredit program right for now.

Content delivery

All participants essentially agreed that it is expensive to build up infrastructure and it would make sense for the VUSAT to link with many of the platforms and systems already in place. Many ideas, suggestions and offers of help in content delivery were forthcoming from the participants. These were as follows:

- A platform is already being set up for the South Asian Foundation Learning Initiative (SAFLI), which will be ready by June. This aims to take education to the masses and will link South Asian universities and institutes. It makes sense for the VUSAT to link up with SAFLI, which comprises various initiatives to which climate management can be built in. There will be a vacuum between the primary learner at the grassroots level and the content provider unless there is a secondary learner or intermediary (this may be the implementation agency, but many of these may not be well-versed with the content). There should be a parallel set of pedagogy for the secondary and primary learner. Dr Coomaraswamy offered to put Dr V Balaji (VB) in touch with Mr Madanjit Singh to open a dialogue regarding such a linkup.

- Prof Panjab Singh said that it is a good idea for VUSAT to use IGNOU infrastructure and resources. The services of IGNOU's counselors could also be utilized. His main concern is that regional resources should be used for delivery of content. Networks should be created and existing deficiencies met. The existing organizations and structures should be interlinked and the VUSAT should build on these. IGNOU uses satellite-based educational support through Doordarshan, the national TV channel. The VUSAT can use this medium to reach the furthest and remotest learners. IGNOU uses the latest ICT for maximum outreach, to literally be where the learner is. The delivery systems used are print, audio, video, radio and TV broadcasts, laboratory practicals, contact and counselling sessions and teleconferencing. Its outreach program uses 6 digital earth stations, beaming Gyandarshan (TV) and Gyanvani (radio) educational channels. 3 of 6 channels are already operational. One of the 6 will be an agricultural channel, which could be a ready platform for the VUSAT. Gyandarshan (GD) I is a 24-hour free channel, used as a national resource center by organizations like the UGC.

  GDII has interactive sessions between experts in various studies, who can be reached via toll-free telephone numbers from 80 cities. Very basic and cheap infrastructure is required for this and people can receive this channel in their homes. This method has tremendous promise because it reaches a vast audience at low cost.

  Similarly, they conduct interactive radioconferencing once a week, where listeners can call in through toll-free numbers and interact with experts. Gyanvani is a FM educational channel in various regional languages and with various educational programs.

  Thus, IGNOU's existing infrastructure is eminently suitable for a collaborative network in development and delivery, with maximum outreach at minimal, affordable costs.

- YCMOU's School of Agricultural Sciences has over 10,000 students. 300 villages are part of the Prayog Parivar program, where like-minded farmers meet to discuss problems and issues. They have programs for illiterate farmers, where certificates are awarded on the basis of skills, with no exams being held. It has an enrolment of 7 lakh people, with 60% rural enrolment. It is the only self-financing institution in Maharashtra. Yash Bharati – a national channel to be operational within 6 months - will broadcast 5 channels, of which one is dedicated to education, one to agriculture, one to health and one to other

universities. They have collaborative programs with other universities, with 1500 study centers. Therefore YCMOU has a wide reach and can reach the unreached.

- Since the target-user of the VUSAT is likely to be semi-literate, a data form of delivery cannot be used; it should be via video or audio media. The content is very important and the device with which the learner interacts is critical. The network envisaged rides on wireless technology, or a computer. Therefore computer literacy becomes crucial. Touchscreen technology could be used. Also, most states already have programs that target RCs. For example, in MP there is the Gyandoot program, as well as one on rural libraries. We should make use of the existing infrastructure.

- The cost of the network is an important factor; we need low-cost solutions. Lack of power and poor connectivity are factors that hinder delivery of information despite all good intentions and objectives. This must be looked into when deciding the method of content delivery. We need to look for innovative solutions for power problems in villages. The network should be interactive – if not, the farmer will be able to use the knowledge. With respect to the mode of setting up the network, the use of a public-private partnership was suggested. It was also suggested that the task of content development be given to some agency that has prior experience in this. Add-on services to this network may eventually find some takers. Financial and intellectual viability is also of great importance for the VUSAT.

- Most RCs do not have phones, whereas most have TV and even cable TV in the regional language. VUSAT should thus look at existing linkages when considering the mode of delivery. Farmer-to-farmer interactions are high but their links with agricultural officers and government agencies tend to be poor. Farmers tend to glean a lot of information from the radio. Also, pertinent information should be provided at the right time, i.e. when it is most required. It should be kept in mind that most RCs are unlikely to watch educational programs on TV – they prefer entertainment. Thus, knowledge being imparted for their benefit should be woven into entertainment programs that they tend to watch.

- APRLP works through existing infrastructure and tries to make any program a sustainable one. They are currently working in 208 villages during the fourth successive drought as to how the community can manage the drought. Social funds and social networks are already in place, using appreciative inquiry as a tool. In the collaboration with ICRISAT at Adakkal there is a community hub, with 5000 women managing the center. We could link with MANAGE, where video facilities are being provided to facilitate primary stakeholder-to-primary stakeholder connectivity. Supply-driven programs have to be made demand-driven. 1000 information centers will be set up (600 in existing watersheds), women's groups exist and negotiations are on with ITC to set up *eChaupals* in Mahboobnagar. All these can be made use of by the VUSAT. SERP has Velugu programs that have 500 learning centers for women at Mandal level.

- The Drought Monitoring Cell (DMC) of the Karnataka government plays an important part in notifying areas about impending drought so that response systems can be activated. The DMC has infrastructure already in place and would be a willing partner in the VUSAT initiative – their Rythu Mitra Kendras could be used as rural centers.

- CRIDA has a National mandate for developing drought management strategies in India, and so the VUSAT is relevant to this mandate. Intervention must match inputs and the system must be geared up to face drought. There should be two types of delivery of knowledge: (i) Courses can be developed on the basis of 150 years of weather data and knowledge that is already there. (ii) educating farmers then and there on what and how

to implement knowledge during drought or aberrant rainfall. CRIDA can give substantial help with developing technological inputs to develop modules.

Organization (roles of various partners, structure and funding)

The participants described their visions of what the roles of various partners would be, how exactly the VUSAT will and should function and where funds could come from. Their inputs are summarized below:

- The partners and the partnership role for each resource must be identified – who exactly is going to take up each activity such as content creation, delivery systems, etc. The responsibilities of each should be identified at the start. Once this is done, other things will follow.

- One concern was that many people have content that can be given to end-users. However, in the proposed VU, who will actually have the pooled content? If each partner uses the content it has, the effort will be useless. Therefore, a common platform is necessary.

- The VUSAT seems to be attempting not just climate management, but to educate the farmer in basic farming practices. It's one thing to tell the farmer what he needs to do during the drought, but who is going to give the actual inputs and who is going to pick up the outputs? Market relation is something that needs to be brought in. ITC is the only private market related agency in this list. More and more companies need to be brought in who would be able to give the right seed or the right chemical at the right time, and also a marketing organization for companies that would buy the products. It is all very well to advise the farmer to grow some other crop, but he will want to know who is going to buy it. Unless the entire loop can be put in and a relationship like this built, the entire effort will be incomplete.

- The VUSAT is trying to build a value chain and the success of this depends on how the whole process is institutionalized and sustained. The value chain will not have a mere social and developmental impact. A consortium has its own benefits and weaknesses, and a business organization has its benefits and weaknesses. We could look at a hybrid model of a colloquium, which is easy to set up but difficult to sustain, and a business enterprise, which is difficult to form but is sustainable as it is based on sound economic principles. Based on this, the value chain could be divided into three parts: the first is strategic ownership, wherein ICRISAT and partners own it, invest in it, measure the impact and deliver the results. The second is operational ownership, between the delivery (network) companies, including the universities. The last is social and economic ownership that builds up the micro-enterprises at that level where the user and small entrepreneurs at the local level join together and help us in delivering the whole value chain. If we can integrate the whole value chain in this process, each level has a clear ownership and a clear investment and return philosophy. The second and third part of the value chain can be built with the help of companies such as ITC, who also provide inputs and have a business perspective.

- Private-public entrepreneurship is the aim of the VUSAT. In many states, lots of infrastructure has been put in at enormous costs. The VUSAT can build on such networks. Information should be in the local language and it should be locally marketable (marketing is an important issue at the local level). Small regions and cluster-level operations should be made financially, technologically and educationally sustainable. Once this network is established, others could use it for their own purposes and to reach clients. It could become a source of income to the VUSAT. The VU is a future generation,

distance education, open-learning system and an organization of the 21st century. It will not replace anybody. Each partner could give a small corner for the VU, through which they could share their knowledge, etc. They will in turn get all the benefits that such a consortium can offer.

- There will be different types of partners. One group will consist of those who hold information relevant to this exercise. There should be some user consortium of selected farm families and organizations as they would be the ultimate judges and guides as to whether the system is of use to them. Then there are the managers of knowledge systems, the technological aspects of delivery and the funding agencies. Therefore, we would have to think of strategic partnership at various levels.

Overall organizational management: As few bodies as possible are planned – only two: one at the international level and one at the organizational level to help and guide the institution. There will be an executive director supported by directors. There will be a board of directors at the national or international level.

Network management: The projected costs are the total costs that would befall all the partners. YCMOU has very good servers and they would need to make just a few changes. Similarly, MSSF have already-established village-level hubs and so no major additional investment would need to be made by them. We have entered a phase where, world-over, media organizations are realizing the need for localization of their content so as not to lose relevance. If the VUSAT succeeds, it will mainly be on the basis of harmonizing the power of broadcast technology with the need for strong localization. Therefore, the concept of grid computing will be promoted, where each institute builds a cluster within its own organization and then a way is found of putting all this spare capacity together so as to generate an extraordinarily large capacity for computing and network administration. One central capacity for the VUSAT will not be created; instead everyone's capacity will be strengthened in a focused way and then connected to create a mega-hosting capacity.

The VUSAT should seriously take up open-sources, as the costs of maintaining proprietary software such as MS or Oracle are prohibitive. In India, there is enormous talent and quick rollout of open-source technology that can be tapped. As far as connectivity is concerned, MP and Maharashtra have taken up corDECT and WLL at the local level. ITC has used satellite-based wireless technology. All these technologies could be harmonized. For example, cluster hubs could be connected via satellite and from cluster hubs to villages, we can use a terrestrial WL system. Many options are available, especially with delicensing going on.

Structure: Very few of us are used to working in a virtual mode. Subject to agreement between partners, the directors will stay where they are but each will devote some time in a focused manner. A secretariat is required for line functions like helping partners in network administration, in the use of object-oriented databases and similar backstopping support. A high transaction cost system is not envisioned, where a large part of the investment would be used to service a secretariat. Instead, funds will be raised locally and spent locally, except for a small contribution towards maintaining the secretariat.

The major participants in this exercise will designate one person (a director) to give some time to the question of dry farming practices and problems of the semi-arid regions. The system will not add to the cost of the exercise and will generate a feeling of partnership among the institutions. This will be a multi-level, multi-interest partnership that can be designed as a value chain where everyone adds value and profits are divided among all partners.

The management at all levels should be clearly defined. At each level some sort of management and coordination should be spelt out so that everyone need not keep coming back to discuss each issue when it comes up. Activities and roles of various organizations should be defined now and issues taken up one at a time.

Prof MSS: Six institutions have been mentioned in the concept paper from 6 states and maybe we should start with these. We need information specific to these states in order to begin on 5 June and make an impact in the first phase.

Various institutes and organizations were suggested that could be a part of the consortium:
Data providers – CRIDA, DST, ICAR, IIT, ISRO, ITC, CSIR, NGRI, NIH, CWC and Central Groundwater Board, Ministry of Agriculture and of Water Resources, NIRD, IRMA, MANAGE, NABARD, the Seed industry and NGOs. In relation to each State, the focal institutions could be identified later. There must be a MoU between ICRISAT and focal institutions wherein the latter should identify micro-level institutions that could be included. We could use the roles to identify the organizations.

A few key institutions should be used. Ous: IGNOU, BRAOU, Rajasthan, YCMOU and Sri Lanka. Local level should be focal institutions that already have expertise in rural regions. International agencies: COL, ADB, DFID, EU, FAO, UNESCO, USAID, UNICEF, UNDP/UNIFEM, ICRISAT and IWMI.

Initial Funding: Initial partner institutions should contribute to a seed fund but this should not become a factor that prevents them from joining. The VUSAT will see if it can get a larger donor who will underwrite the initial expenses. It could be a cost-free or cost-contributing collaboration, as some will contribute in the form of huge data inputs. Some organizations should be able to anchor the VU at the regional level. Various roles and ways of bringing funds should be looked at. Once a group is formed, the VUSAT will be able to mobilize funds using members' links and contacts. ICRISAT, with CRIDA and ICAR, has been helping FAO develop a regional program on drought-coping mechanisms, so if this venture could become part of that framework, they will be able to generate more funds for the VUSAT. Corporate foundations that service the rural sector could also be considered. Much funding can come from the state government as well. The initial budget should form a corpus to begin developing relevant modules.

Prof Kaushik suggested that if the VUSAT is being launched on 5 June, and partners want to make some tangible impact, they could create a broadcast or interactive special interest program with ICAR or some agricultural institute. IGNOU would be happy to give airtime for that. The first few modules should be very relevant.

Concerns of participants

(i) Why have the Community Learning and Information Centers (CLICs) been delegated to a later phase of the program according to the draft concept note being discussed?

(ii) There is a whole system of information in place already about drought, drought-preparedness and early warning systems (EWS) for scenarios of climate. Most states are already doing something about these, independently of a VU format. The concerned departments should promote drought EWS in different parts of the country. The second phase should be linking that information with adaptive response, bringing in expertise based on research, and farmers' own experience and indigenous knowledge into a university framework. Are we looking at a 2-phased approach or suggesting that EWS become a part of the OU framework? Does that become demand-based then, or it change to supply-based?

To what extent are State groundwater (GW) departments and Central GW Board involved in farmers' attempts to tap GW? Is there a power supply infrastructure for GW pumping? Extra allotment of power to farmers during drought is difficult to cut back once the drought is over. These issues need to be addressed. The OU versus linkages with the decision-makers is a critical issue.

MSS replied to this that when the consortium is formed, the India Meteorology Department and the central and state GW Board must be brought in, as well as Central Water Commission. In fact, all holders of knowledge relevant to the SAT will have to be brought into a technical consortium, even if they are not part of the management and financial consortium. It is in their interests as well. Proactive and anticipatory action in terms of Early Warning must be there. Now that we have some capacity in medium-term forecasting, these must be fed into the system. Different computer simulation models depicting various scenarios would be of great value to farmers.

Ram Takwale responded to various issues brought up by participants as follows.

Platforms already available will be used as a knowledge platform where knowledge will be pooled together. Some interfaces must be formed, which will mould and tag the knowledge appropriately so that it can be useful for all. It should be taken up as a technological exercise as the VUSAT will be a technological-driven project. This will have to be done by international experts.

Resources from other institutes: all resources, national and other, will need to be used. However, the VUSAT's unique target group needs to be kept in mind. The VUSAT is in a transmission mode of giving the information, but education will take place only when there is a high level of interactivity between learners and information providers, and this is localized. We need to figure out how to achieve this. The people should be able to use information in their local environment to improve their lives. Thus, IGNOU's resources will be used, but the VUSAT has to tackle how to bring in the interactivity, relevance and localization.

There should be a mechanism of ground-level learning process. The education given must be received and internalized – this part must be stressed. Prayog Parivar of YCMOU is a model where farmers come together and start learning from each others' experiences, queries, etc. The learner may begin to question the information provider if he feels the information is not appropriate to his particular situation.

The mechanism that should be used is taking information to them and asking them to choose or decide according to their situation and experiment with the information. A mechanism like Prayog Parivar or Swadhyay groups should be used. The mobilization of such groups where groups or individual come together and their knowledge support will be an important part. We should not give what we think is right but what they demand. Let us not underestimate the capacity of the common man.

How should the VUSAT ensure that it does not deviate from the primary group? The training could (as was done in the case of tannery workers) be taken to the workplace. Here the delivery actuators, who will be trained and through whom knowledge will filter both downwards and upwards, would first have to be identified. These are the local people, who will be focused upon first.

Partnership should include the users along with those who are creating and promoting the knowledge. Bottom-up approach is most important and must be built into the system. Social mobilization is important. Empowerment process should be taken to the people, for which the experience of voluntary agencies will be useful. They should also be partners at that level.

The VUSAT aim is not to set up computer centers in each village. If the infrastructure is already there, it will be supported through knowledge and services inputs. The VUSAT is not going to put in the capital, which might come from other sources. A business model must be built up at that level, which will make it technologically and financially self-sufficient. Eventually farmers should be able to pay themselves, with maybe government help to those who cannot. Even giving help sometimes becomes counterproductive and kills the people's initiative. Strategies would have to be chalked out for giving subsidies.

Conclusion

Prof MSS summed up the discussion by saying that the success of the VUSAT will depend on the power of partnership in terms of knowledge, technology and user assessment. This initiative addresses a group that is in real need of the knowledge the VUSAT plans to impart. He added that the MSSF would give all possible support to the venture to be able to launch the VUSAT on 5 June 2003.

Dr Dar concluded the meeting by saying that ICRISAT cannot do this alone and has always used the key strategy of partnerships. He thanked all participants for helping to make the dream of the VU a reality. This is the first major effort to go directly to the primary producers – the poor farmers – and is more comprehensive than previous efforts. Dr Dar said: "There is so much challenge, but also so much opportunity out there, and together, we can hurdle all obstacles."

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Participants to the roundtable discussion on the establishment of a Virtual University for the semi-arid tropics

27 February – 0900 to 1700 hours

L D Swindale Board Room

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Feasibility study on the establishment of VUSAT

Information Resource Management Office
ICRISAT

A Virtual University for the Semi-Arid Tropics (VUSAT)

Feasibility Study Report for the Establishment of a Virtual University for the Semi Arid Tropics

Prepared by:

Professor Ram Takwale

February 2003

Pune, Maharashtra, India

A Virtual University for the Semi-Arid Tropics (VUSAT)

A Virtual University for the Semi-Arid Tropics
(VUSAT)

Chapter I. Background

ICRISAT is mandated to work in the semi-arid regions of the tropics to enhance food security thorough impact-oriented research. The Management of ICRISAT views inclusiveness as an essential component of their work and actively promotes new ways and technologies to realize this inclusive paradigm.

With that purpose, the ICRISAT is interested in exploring a way to make use of the emerging paradigms of open/distance learning and ICT to reach researchers, policy makers, administrators and organizations of families living in drought-prone areas with new knowledge and information for enhancing their capacity to cope with climatically-induced stresses that affect productivity and livelihoods.

ICRISAT along with a key partner, the M S Swaminathan Research Foundation, is considering launching a Virtual University in the SAT covering the South Asian region that is facing recurrent drought and increasing shortage of water. A note prepared by ICRISAT clearly gives goals, target groups, outputs and outcomes of the virtual university.

This study is meant to analyze key factors that contribute to the feasibility of this proposal and to provide a framework for the functions and activities of the Virtual University.

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Chapter II. Current Status of Virtual Universities

1. Overview:

- **Virtual Universities – Global scenario**

During the last few years, many universities and colleges are getting ready to face the impact of globalization and emerging competition in marketing education. Some are considering this as an opportunity to market their educational programs to support university operations.

The major approach employed is to partner with other colleges and universities and to offer the best available educational courses and services to students at a distance. This is also aimed at survival of small institutions against the competition from big ones. The use of ICT in almost all cases is limited to delivery of the educational products and services, and for connecting with franchise or local institution identified as partner to offer services and facilities to students. Survey of the virtual universities shows that prominent amongst the virtual universities are:

i. African Virtual University - an initiative of the World Bank and some universities in North America, Europe and African countries.

i. Canadian virtual university.

ii. Groups of colleges forming a consortium.

In India there are two examples of virtual universities:

1. Tamil Virtual University to offer education of Tamil language and culture.
2. Maharashtra Knowledge Corporation (MKCL) – a limited Company established jointly by Government of Maharashtra and universities in Maharashtra.

Both are in their initial stages of formulation and operations.

- **COL report on Virtual Education:**

The COL has recently released a study '**The Changing Faces of Virtual Education**' in July 2001. This is a follow-up on COL's landmark study on current trends in "virtual " delivery of higher education (**The Development of Virtual Education: A global perspective, 1999**).

The report of 2001 observes that ' the virtual education is now part of the planning agenda of most organizations concerned with education and training. And the terminology being used to describe is even more imprecise and confusing! On the

reality side, there are many more examples of the use of virtual education in ways that add value to existing, more traditional delivery models. However a remarkable feature of this surging interest in virtual education is that it remains largely focussed on ways to use technology to deliver the traditional educational products (i.e., programmes and courses) in ways that make them more accessible, flexible, and cheaper and that can generate revenues for the institution.

The growth of the virtual education is largely occurring in countries with mature economies and established information and communication infrastructure (ICT). The report concludes that a lack of development capital means that the developing countries of the world have not been able to, as yet, use virtual education models in their efforts to bring mass education opportunities to their citizens.

The report however points out that there are several trends, called "macro developments", are emerging , and are likely to bring about radical changes to the way we think about the concepts of campus, curriculum, teaching/learning processes, credential / awards and the way ICTs can be utilized to enable and support learning.

The COL has further taken a pioneering step in preparing a report on **" The case for a virtual university for small states"** to serve the small states of the commonwealth, using their existing structures and capacity. The concept of the virtual university in this case uses "macro developments", and comes out with new trends, which include new venues for learning, the use of "learning objects" to define and store content, new organizational models, on-line learner support services, quality assurance models for virtual education and the continuing evolution of ICTs.

- **Summary of the virtual university concepts:**

i. ICT is used in the delivery mode of educational courses and services.

ii. Partnership approach is used to pool together the best resources to offer best education content and services.

iii. Traditional model of organization of course content and delivery is used with hardly any effort to link it to the local needs of the students and society.

iv. Partner institutions are used at the local levels for franchising or twinning purposes. This is an attempt to localize to the needs of learners.

v. The COL report has clearly pointed out the need for changing the organization of the content and its packaging to suit the life-long learning and the needs of local students and community.

The virtual university is a concept at the initial stage of development and operations, and offers an opportunity to radically transform the existing practices of campus, curriculum, teaching / learning process, organization and delivery of content and above all the goals and objects of education. Education can now be made central to all

the human developmental activities by developing radically different paradigms of education.

2. COL Model of a Virtual University

- **The Concept of a Virtual University:**

We adopt the concept and model of the Virtual University proposed by the COL.
The concept of a virtual university is of a consortium of institutions, enabled by appropriate ICT applications, working together in practical ways to plan programmes, develop the required content and ensure the delivery of those programmes and support services to learners.

Three features of the university need to be underscored:

1. The virtual university is not being proposed as a university in the conventional single institutional sense. It will, in fact, be a "virtual organisation."
2. The virtual university will carry out its functions by optimizing ICT applications, particularly those that enable the creation and deployment of content databases based on learning objects. It is therefore a bold and challenging vision of a virtual university that has the promise of enabling the consortium of member institutions to become leaders in the development of virtual education models that can be tailored to the realities of the learners they serve.
3. The virtual university will be as much concerned with "adding value" to conventional on-campus instruction as it is with serving learners at a distance.

- **The functions of the virtual university**

1. To provide a vehicle for collaboration in the development and use of emerging technologies that are needed to develop virtual education models such as subject matter databases and learning management systems.
2. To provide leadership in the planning, design and delivery to learners of programmes, curricula and courses that are pertinent to the human resource development needs of the target groups identified.
3. To provide support services to students, which would include assessment of current skills and knowledge, advice regarding academic plans, quality-assured access to courses, record of learning and the provision of awards where these are not available from other organisations.

- **Core activities**

1. Needs assessment.
2. Programs development and delivery.
3. Development and maintenance of virtual systems.
4. Provision of learner support systems.
5. Leadership on policy development and strategic planning.
6. Research on virtual education.
7. Internal staff development

- **Brief review of the Virtual University indicates that:**

1. COL model is futuristic and needs to be adopted as the basis for the VUSAT
2. The VU concept driven by ICT will enable us to develop new paradigms for
   i) Development, organization and delivery of content
   ii) Extend goals, objects and processes of learning, teaching and evaluation, and
   iii) Linkage of education with development.

We will be incorporating the core activities in the operational set-up of the proposed virtual university.

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Chapter III. Practices of Open and Distance Education

1. Open and Distance Education (ODE)

Since the initial phase of the Virtual University is being established in India, it will be pertinent to consider the efforts and experiences of the Indian Open Universities and Distance Education Institutes that will have impact on the structure and functions of the Virtual University.

The model and practices followed by IGNOU and state open universities are recommended by the UGC and DEC to all the Distance Education Institutions of duel mode universities in India. The Indian OUs followed the structure and operations of the UK Open University in almost all cases and made some changes to suit Indian context.

Following observations on the nature and functions of the open and distance education (ODE) system will be relevant to our feasibility study for Virtual University.

- **Main Features of ODE in India:**

General and Structural:

1. Industrial Model of Education:

The open universities in India as elsewhere are designed and developed on the industrial / factory model of education, in which various functions such as planning, designing, development, production, delivery, feedback assessment and reforms are well demarcated and coordinated. In fact they form a chain of operations resembling conveyer belt.

It will be necessary to move away from the Industrial model and evolve informational model. Non-linearity and flexibility that would enable to give total autonomy to learners should characterize the informational model.

2. Limited Goals and Objects of Learning:

The OUs have adopted the format of the formal university structures in case of goals and objects of learning. Usually a study of a learner ends with the award of certification.

The VU will have to extend the goals and objects and make it suitable for life-long-learning and developing.

3. The Target Group Coverage:

The OUs have expanded target group coverage and have offered courses to working and mature adults. In Indian situation, where a large population is still illiterate, and many dropout at the primary school stage, the working & mature target group of the OU gets automatically limited to tertiary educated or dropouts from degree programs. This also includes some dropouts from secondary and high school level.

The proposed VU aims at the rural people and communities, and will have to design its goals, objects, functions and structures to suit the identified target groups.

4. Content development - Course Team Approach:

One of the major contributions of the Open University system is the creation of self-instructional materials designed pedagogically and developed by the best experts and teachers by pooling their experiences. This unique method of content creation with the help of a Course Team, first developed by the UK Open University, is now widely used by many open universities. The open universities are still having print as their mainstay for learning of students. Development of print instructional materials and its production are quite lengthy and complex processes requiring a long time, often about 18 – 24 months. This makes the whole process very costly and the content once developed can not be changed easily as and when required.

The virtual university will have to use fast track methods for developing content, use multi-media and audio and video interactivities to create and enrich instructional materials / learning resources, and ensure dynamically changing content.

5. Content Organization:

The OV content is organized in a modular way with a number of courses forming a program leading to a certificate/diploma and degrees. Each course is further divided into sections / blocks and units / chapters. Unit like a chapter in a book forms the smallest instructional unit.

The current functioning of open universities gives flexibility in choosing and combing programs according the choice and need of the learners. The smallest practical unit of learning is of about 4-8 credit points. However offering complete learner autonomy in choosing objects of learning and corresponding content in his/her area of interest remains still a dream of the open learning system.

The way out suggested by the COL model, the granulated object based content organization, appears to be the way of moving towards the goal.

6. Content Delivery:

This is the most complex operation requiring major university efforts and resources. In fact building an Open University required construction of huge warehouses and distribution mechanisms. In fact IGNOU has become the biggest publisher in India.

However the delivery of content i. e. study material to learners and study centers proves to be nightmarish experience of Open University vice-chancellors.

Stranglehold of print medium has to be eliminated by the VU, and content should be developed and delivered in the electronic form. Audio, video and multimedia presentations should become the main learning media. Print however has many advantages. In order to cater to the cultural needs and convenience of the learners in using study textbooks, different mechanisms of printing, packaging and delivering the printed content - books should be employed during the next few years till pocket computers like a cell phone becomes personal appliance accessible and available to every learner in the target group.

7. Credit Point System:

One of the major contributions of the Indian ODE, is the adoption of Credit Points (CP) by linking it to the total learning hours. IGNOU one Credit Point requires study of about30-33 hours, which includes all learning activities.

The CP is a convenient device in measuring an instructional unit and should be adopted by the VU. The VU needs to define appropriately the granule in terms of its instructional size appropriate for an object to be fulfilled, study hours needed by an average students to master it, the areas / subjects and objects with which it can combine etc.

8. Study Center (SC):

Indian ODE system adopted **Study Center** approach for didactic and socialization purpose, and now it has become a key mechanism of the university for delivery. The Study Centers are established close to learners and equipped with all facilities for learning. The teachers in the Study Centers are appointed on their work basis. The Center is managed by the local educational institution or by private / institutional management. It is a self-supporting unit; and usually it does not require the host institution to contribute in terms of cost of operations. Part of fees collected is shared with the host institution in managing the SC.

The Virtual University has to adopt a similar mechanism. Since the community and local workers are the primary target groups of the Virtual University, the centers should be located in practically every village or community for providing learning and information to students. This is really quite a big task and has to be approached in a different way.

9. The Teaching – Learning Process:

Teaching –learning process adopted in ODE is mostly personalised study done by a student at home or at study center under the guidance of local teachers. The pedagogically designed self- instructional materials, the study texts, are given to each learner for personal study. It is supplemented by face-to-face teaching at the Study Center, where supplementary learning materials in the form of audio and video tapes are made available.

IT is being used in teaching now to supplement the study at the local study centers. IGNOU is using distributed classroom for many courses for teaching. These days a few Open Universities for communication between students and university staff also use Internet.

The pedagogic model used is of donor – receiver; the teacher giving knowledge & learner receiving it. Excepting some courses, it is mostly one-way flow.

The VU has to move away from this model and consciously link studies and learning and with issues and problems faced by the people and their communities. Addressing their problems and making education demand driven is going to be a challenge of the Virtual University education system.

2. UNESCO Studies and Reports on Higher Education:

Many of the studies and reports of the UNESCO on higher education can offer sound foundation to the formulation of the Virtual University as an institution of the 21st Century. Some of the aspects of studies related to VU are given here briefly.

i. **Core mission of the higher education system** is to educate, to train, to undertake research and, in particular, to contribute to the sustainable development and improvement of society as a whole. This mission should be further expanded **to educate highly qualified graduates and responsible citizens and to provide opportunities for higher learning and for learning throughout life.**

ii. **Relevance in higher education** should be assessed in terms of the fit between what society expects of institutions and what they do.

iii. Higher education is part of a seamless system starting with early childhood and primary education and continuing through life. The contribution of higher education to the development of the whole education system and the reordering of **its links with all levels of education**, in particular with secondary education should be a priority.

iv. The **international dimensions** of higher education are an inherent part of its quality. And networking, which has emerged as a major means of action, should be based on **sharing, solidarity** and **equality** among partners.

v. The Delors report of UNESCO points out that education throughout life is based on four pillars: learning to know, learning to do, learning to live together and learning to be.

This can be the goal of the education that the university will be imparting.

vi. Another UNESCO Report (1997) identifies the **challenge before the universities for developing Open Learning Communities**. We will be incorporating these expectations in the formation of the virtual university.

Four Pillars of Education

The 1996 UNESCO Report "Learning: The Treasure Within" usually referred to as the Delors Report, points out that education throughout life is based on four pillars: learning to know, learning to do, learning to live together and learning to be.

- **Learning to know**, by combining sufficiently broad general knowledge with the opportunity to work in depth on a small number of subjects. This also means learning to learn, so as to benefit from the opportunities education provides throughout life.
- **Learning to do**, in order to acquire not only an occupational skill but also, more broadly, the competence to deal with many situations and work in teams. It also means learning to do in the context of young peoples' various social and work experiences which may be informal, as a result of the local or national context, or formal, involving courses, alternating study and work.
- **Learning to live together**, by developing an understanding of other people and an appreciation of interdependence- carrying out joint projects and learning to manage conflicts- in a spirit of respect for the values of pluralism, mutual understanding and peace.
- **Learning to be**, so as to develop one's personality and be able to act with ever-greater autonomy, judgement and **personal** responsibility. In that connection, education must not disregard any aspect of person's potential: memory, reasoning, aesthetic sense, physical capacities and communication skills.

Search for solutions to these challenging questions will link the processes and contents of globalised nature to the local environment. Pluralistic cultures and distinct heritages of different communities and societies will lead to multiplicity of situations. The process of globalization and localization has therefore to be simultaneous and well integrated.

Developing Learning Communities – A Challenge before the Universities

Another UNESCO Report (1997) identifies the challenge before the universities for developing Open Learning Communities by posing the following questions:

- What would learning environments look like if they were constructed from the perspective of each learner-sensitive to the learning needs, pace, local culture, values, interests and aspirations and geared towards developing each human being's individual and collective potential?
- What would learning environments look like if they were constructed and managed by the learners and communities and linked to dynamic processes of continually identifying and realizing their development priorities?
- What would learning environments look like if they were comprised of dynamically inter-connected diverse learning communities that shared

information, culture and experiences and supported the evolution and construction of local knowledge systems?

- What would learning environments look like if they allowed learners the flexibility to move in and out of them and encouraged wider social interaction?
- What would learning environments look like if they tried to engage in their own organizational learning?

3. Educational Processes and their inclusion in Virtual University Functions:

Any university belonging to the formal, non-formal or informal nature has to incorporate the following basic educational processes and functions, which should be independent of delivery modes of formal, non-formal and informal as well as technology used. Such processes are:

1. Learning, teaching and evaluation.
2. Creating Knowledge and Learning Resources.
3. Developing Infrastructure Facilities.
4. Creating Learning Environment.
5. Managing Education.

All these functions are human based The technology facilitates transforming ideas and concepts of learners and teachers into various ICT devices, and the education system designed uses interactivities between students and learning and knowledge resources for achieving learning. The basic process of teaching and learning is helped by adopting different pedagogical models of learning to evolve newer paradigms of education.

ODE is defined in many ways. On the basis of defining features of the Distance Education one may identify the main features of the Virtual University.

- **Main Features of a Virtual University:**

The VU could be characterized by:

1. **Electronic Network** ensuring connectivity with all Education and other Service Providers and learners and their communities.
2. **Local Facilitation Center** established close to or near working places, living places or community of the learners for didactic and socialization purposes.
3. **Educational Environment** offering all types of communication, learning & knowledge resources and learning support services with just-in-time help from experts and experiences to individual and group of learners.
4. **Well-Organized Content** in a pedagogic and self-instructional formats to ensure seamless and Life-Long-Learning (L3).
5. **Delivery Organization** to support developmental education for ensuring personalised learning and learning communities so as to enable linking learning, working, living and developing continuously.

6. **University Management** guided by well-defined goals and objects and organized to ensure Total Quality of Education in a Knowledge Based social context by offering autonomy to learners and their communities.

The main features also identify the functional units/divisions of the Virtual University.

4. Impacting Features of Indian Open Distance Education:

Many features form ODE that could be adopted in the Virtual University are given above. In general:

1. Planning and designing are the primary processes for any organizational establishment. Development and delivery are the processes that depend on the processes the university uses. The VU will have to design its own development and delivery system.
2. The Indian ODE system offers study center approach for delivery. This should be adopted by establishing such centers for community learning and information.
3. The Course Team approach is another device for creating quality content. Such teams could create the content. However their granulation at least during initial stage has to be done by an expert team of the university.
4. Content organization and packaging in Virtual University has to be radically different. The delivery should be entirely electronic for e-content and distributed in case of print material. The VU should do the coordinating task and evolve paperless environment for educational management.
5. Another major departure form the current ODE practices is the central-local learning resource linkage. Extensive ICT use will eliminate weaknesses in local experts and teacher services at the learning centers, and enable the system to extend best knowledge and learning resources and expertise to the learners and learning groups / communities located anywhere.
6. The goals and objects have to be extended and made suitable for life long learning and developing.
7. The teaching / learning should be such as to enable the learners reconstruct their own knowledge suited to their local contexts and environment by retaining global nature of it.

All these features are to be incorporated in the formulation of the Virtual University.

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Chapter IV: Inclusion of Non-Traditional Groups as Students

Since we are developing VU in India first, it will be instructive to learn from the Indian Experiences.

Non-traditional groups, particularly the less educated / early school dropouts and rural communities were targeted by the YCMOU in its attempt to evolve it as a Man-varsity. The IGNOU added school of continuing and Extension education in an attempt to offer education to non-traditional groups and also for ensuring life-long-learning. We list below their activities

YCMOU :

- Tech-voc courses for less educated.
- Crop-wise courses and agriculture courses for farmers.
- Prayog (experimenting) and swadhyaya (learning) Pariwar (close community group) for groups learning and developing.

IGNOU:

- Panchayat Raj education and training program - supported by Govt. of India.
- Training of construction workers in partnership with Construction Industry Development Council of the Indian Planning Commission.
- Tannery workers' training in co-operation with Indian Leather Research Institute, Chennai and association of small industries in Tamilnadu.
- Programs for grassroots such as youth leadership, women empowerment etc.

- **Special Features of the Experiments:**

i. SIM was developed to suit the less-educated target groups in partnership with institutions and organizations interested in developing and promoting the activity.
ii. The IM was delivered through the agencies/groups working at the grassroots. Ex. The course for tannery workers was delivered in association with small scale tannery industry association in Tamilnadu.
iii. A new mechanism like self-learning groups / Swadhyaya Pariwar and Experimenting groups / Prayog Pariwar were established in rural areas. The idea of Prayog Pariwar is adopted by farmers in Maharashtra and is included by YCMOU in its delivery mechanism.

We therefore propose that forming SIGs of various types to promote diversity of interests in rural communities be adopted as a strategy for social mobilization. The groups should be of permanent or quasi- permanent nature and be linked with the major NGO/GO working in the local / rural communities. The agencies / organizations which have fairly long experience and expertise in working with rural communities should be made delivery actuators for the purpose of social mobilization.

Experience shows that individuals and groups, particularly from weaker and disadvantaged sections, benefit more and get strength if they are organized in a chain by using ICT and by giving 'Central' support in terms of information, knowledge and expertise as well as other necessary support. This responsibility could be entrusted to a 'central' organisation, which could be made partner institutions in the region / area concerned.

The aim of the SIG should be to promote specific interest such as economic development (marketing, services, value addition to their current activities etc), educational and cultural development all linked through education – life-long-learning.

The SIG working should be open, transparent and democratic. In fact participatory decision making may enable the SIGs to choose the nature & type of development they need most. Such efforts like women's self-help groups are already a great success; and with their help we should built the program of social mobilization.

We therefore propose that objects of the VU to achieve the outcomes expected should include:

1. Promotion of **social mobilization** through various groups and community activities for **ensuring life-long learning linked with continuous development**.
2. Enabling people and their communities to **achieve self-directed sustainable development**.

The VU should have a division, which should take care of social mobilization for self-directed development of people / SIGs and the community at large.

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Chapter V
SAT Virtual University:
Goal, Objects, Outputs and Outcomes.

We propose here goal, vision, objects, outputs and outcomes of the proposed Virtual University framed on basis of the concept note prepared by ICRISAT. They may be suitably modified and altered.

1. Name of the Virtual University:

Two names are used:

1. SAT Virtual University.
2. Virtual University for Climate Management.

Dr. Swaminathan Committee appointed for 'An Action Plan for Agriculture for Coming 25 years' for Maharashtra has proposed a name of '**VU for Agrarian Prosperity**' for the state of Maharashtra.

One may think of any other name better suited to the Virtual University.

In this report we adopt the name of **SAT Virtual University (VUSAT).**

2. Geographical Area Covered:

The VUSAT will cover the regions of **South Asia and Africa.**

- **First Phase** of two years will cover some Indian states (first year) and neighboring South Asian countries (second year).
- **Second Phase** of three years will include African countries.

3. Goal, Vision, Mission and Objects of the VUSAT:

Following goal, vision, mission and objects are proposed:

- **Goal:**

  To develop climate literacy and expertise for drought preparedness of people and their communities by using latest scientific knowledge, Information Communication Technologies (ICT) and community mobilization to minimize impact of drought on people and environment.

- **Vision:**

  Improved well-being of the poor through agricultural research, virtual education and development..

- **Mission:**

  To help poor through science with a human face and partnership-based research and development, and to increase agricultural productivity and food security, reduce poverty, and protect the environment in production systems.

- **Objects of the VUSAT:**

The University shall strive to:

i. **Provide sustained information and education** to all people, particularly to the most vulnerable rural communities.
ii. **Carry out social mobilization** to manage and to mobilize for reducing the impact of the drought.
iii. **Use the latest ICT and educational and learning technologies** to inform, educate and mobilize people.
iv. **Create a network** of policy makers, researchers, educators, service providers and farm communities for achieving effective drought mitigation.
v. **Enable people to make better choices** and to have better **control over their own development and destiny** particularly at the time of emergency by enhancing information flows and climate related knowledge to vulnerable communities.

4. Target Groups:

The concept note on Virtual University gives the following target groups:

The **target groups** to be covered by the VU are:

- Primary –
  1. Farmers, women, villagers and citizens in general.
  2. Rural communities and their institutions.
  3. Local climate managers, Rural Development (RD)workers, local service providers
- Secondary –
  1. Knowledge generators,
  2. Policy makers, State and district Govt. officials and
  3. Rural Development Managers.

The focus of the virtual university will be on primary target groups, whose payment capacity or attitude to pay is quite weak. Because of poverty and illiteracy, many do not have the skills and competencies to take advantage of the knowledge based developments.

It should be noted that inclusion of the common people and their institutions and communities has given completely different dimension to the VU. Their needs and requirements should get reflected in the structure and functions of the university.

5. Output and Outcomes Expected:

- **Expected Outputs**

The VUSAT is expected to come up with the following:

- Trained community volunteers, farm families, development workers, and service providers on all aspects of climate management;
- Computer-based distance learning modules on drought mitigation, best practices and livelihood options under drought, and disaster preparedness;
- Multi-media information and education materials on drought and climate management;
- Regular updates on weather and climatic trends, and
- Public policy options and advisory on climate management.

- **Expected Outcomes:**

The VUSAT should ensure the following outcomes:

- **Empowered rural communities** with abilities to forecast, prepare, manage and mitigate drought.
- **Mobilized and learned social infrastructure** for climate management.
- Improved and sustained **farm productivity and livelihood opportunities** among vulnerable communities in times of drought.
- Enhanced **information and knowledge flows** among stakeholders on climate management.
- **Informed policies** on climate management and drought mitigation.
- **Minimum adverse economic, environmental, and social effects of drought** on vulnerable communities.

The challenging task of the virtual university is addressing the issues and problems of the primary target groups. Due to poverty and illiteracy existing in the regions of rural India, the university will have to extend and expand its consortium concept to include many organizations and institutions working in the rural areas. The involvement of the grassroot level organizations in developing skills and competencies in common people and their community may alone lead to the outcomes expected above.

6. Subject Areas to be covered:

- **Primary focus of the VUSAT should be on draught mitigation and management.**

- **Global Themes:**

Any consideration of draught and its impact leads us to a wide variety of subject areas such as climate and monsoon behavior, water and its conservation and utilization, management of impact of draught on people, livestock, food and fodder security etc.

In fact the Global Themes identified by the ICRISAT along with its Goal, Vision and Mission could be taken up in their general form as the subject domain areas of the Virtual University.

- **Global Themes:**

    1. Harnessing Biotechnology for the poor
    2. Crop management and utilization for food security and health.
    3. Water, soil and agro-biodiversity management for eco-system health.
    4. Sustainable seed supply systems for productivity.
    5. Enhancing crop-livestock productivity and systems diversification.
    6. Creating futures and development pathways.

- **Challenges and Issues**

While considering these domain areas, following challenges and issues will have to be focussed in the activities and programs of the Virtual University.

1. Reducing poverty, hunger, and malnutrition.
2. Enhancing productivity, quality of crops.
3. Effectively managing a fragile and risk-prone environment.
4. Diversifying income-generating options and commercialization of crops.

Other areas related to agriculture and rural development could be either taken as the part of the Global themes wherever appropriate or could offered as the program of the partner institutions to enrich the VUSAT educational network.

- **Literacy Program:**

The virtual university is driven by the extensive use of ICT in all its operations. We are targeting our programs to the primary target group of villagers and their communities. It will, therefore, be essential for the Virtual University to take up Literacy Program covering Climate Literacy, Water Literacy and IT Literacy in an integrated way as its primary mission.

The literacy, defined as the survival and developmental skills, competency and functionality in the emerging knowledge based society, becomes the foundational program for all. The minimum level of literacy for common people in the information and knowledge-based society would be quite high and would be rising as the globalisation extends its impact on the society.

First and foremost task of the VUSAT will be to design, develop and offer the literacy program.

7. Nature of the VUSAT:

Close examination of the target groups and the outcome leads us to the following nature of the VUSAT:

- **VUSAT should be:**

  1. **Mass-university**.
  2. Offer **education for Life-Long Learning**.
  3. Give **education for achieving development –linking L3 & developing**.
  4. Suitable for less-educated and illiterate people.
  5. Financially self-supporting.
  6. Ensure consortium partnership of international and national institutions and organization.

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VI. Core Functions and Consortium Management of the VUSAT

A Virtual University is a concept realized due to the IT development, which is allowing connectivity, intimate dialogue and access to education to anyone anytime anywhere. A learner joining the university in future will be getting almost all the educational services and interactivities through his/her computer linked to Internet or through service facilitation at or close to home.

1. Core Functions of an Educational Institution

Following **core functions of an educational institution** are to be incorporated in any form of a university:

- Learning, Teaching, Evaluation
- Creation of ICT Infrastructure and Facilities for educating and learning.
- Creation and Preservation of Knowledge Resources
- Creating and Maintaining Educational Environment
- Managing Education

The virtual universities like Open University will be open to people, places, ideas and methods.

2. Core Functions of a Virtual University

The **core functions of the Virtual University** are therefore linked to the following:

- **Network Development and Management:**

This involves putting knowledge and learning resources on websites and servers, and linking them to learners by using Internet and other communication technologies; employing broadband Internet, Grid architecture and development of Knowledge Grid network; using cable and wireless connectivity, broadband satellite along with existing technologies such as radio and television for offering unlimited channels for communicating, educating and learning.

Development of such a network and its access to learners and their communities by employing existing and emerging ICT is the core function of the VUSAT.

This function also involves developing and employing appropriate learning / educational environment and making it accessible to every learner at or near his/her home or community.

- **Content Development and Management:**

This function involves identifying needs and requirements of the various target groups, development of designs of educational programs with appropriate pedagogy,

creating dynamic content of high quality and relevance, designing and developing processes and resources for evaluation appropriate for skills, competencies and functionality development of individuals and groups.

The content should be such as to promote seamless Life Long Learning (LL) by linking learning with living, working and developing.

- **Delivery of Content:**

Delivery involves both academic as well as administrative services by ensuring access and success of the learners and learning communities through developmental education.

- **Knowledge Creation and Dissemination:**

This includes identifying, collecting, creating and maintaining knowledge resources in electronic form needed by learners and learning communities, and offering information services, conducting and promoting research and development.

- **Total Management:**

Besides managing teaching, learning and evaluation of learning and learners, the management function includes partnership management, developmental (education induced /enabled/promoted) processes, leadership in policy advocacy, staff and functionary training, and total quality and assessment & management.

3. Partnership and its Management:

- **Partnerships:**

The VU is a consortium of institutions and organizations who are pursuing their interests and simultaneously joining a common activity of virtual university to get benefit for their own and the common goals. The partnership model will, therefore, work on win-win model and need defining the roles and share of each partner.

The ICRISAT has already identified more than dozen partners at the national and international levels, and their number will be increasing.

Some of these institutions will have to take a lead role and do the anchoring role for the Virtual University to give it sustainability, continuity and acceptability at the national and international level.

Out of these partner institutions, ICRISAT, MSSRF and COL should take the lead role as sponsors of the virtual university. Their leadership at the national and international level and core competencies in domain areas, literacy, social mobilization and experience and expertise in developing the concept of Virtual

University for weaker institutions are highly suitable for the development of the VUSAT

The partnership will obviously be at different levels of interests and involvement. By considering the main functions that the university has to carry out, we propose that following key functions of the partners will be appropriate in the consortium for the VUSM.

- **Key types of partners are:**

  1. IT Service Providers – essentially for establishing and managing network for the university.

  2. Content Service Providers- content includes info, education and continuing activities

  3. Delivery Actuators – who will establish and manage network access centers at local level and ensure their operations and sustainability.

  4. Integrator – management of partners and their partnership, mobilization and promotion of partners at various levels required for success of the university

The partners will be playing various roles; and will carry out their part in the total operations of the university. It will be essential to decide their roles, functions and shares of resources.

- **Consortium Model for Partnership & their Functions**

Multi-level Multi-Interest Partnerships

Level 1: Lead Partners:

Lead functionaries whose leadership is essential for anchoring VUSAT.

1. ICRISAT
2. MSSRF
3. COL

Level 2 : Main Partners

Partners for various service provisions:
State Governments- State Open Universities / International Institutions / National Institutions / other providers of services of education, information, activities etc.
The partners could be grouped into three Groups working at the State and Higher Level:

1. **Education Service Provider:** ICRISAT, State Open Universities, Other organizations at the state and nation level.
2. **Information Service Providers:** State and Central Govt. Departments, other state level bodies. Agriculture Universities, NGO, Agriculture Marketing Boards.
3. **Activity Service Provider:** State and National /International level bodies. Crop Growers Association (Grapes, Pomegranate, Mango etc), Research and Development organizations (VSI, BAIF etc.), Service providers (Courier, Transport, Consultants etc.) and Others

A institution or organization may have multiple interests with high level core competencies, quality products & services and brand name; and could participate for different provisions in virtual university functions at different levels.

Level 3: Local level Service & Facilitation providers:
CLICs, CICs, Local Service Providers, - Experts - Individuals and Groups offering services at local levels.
CLIC- Community Learning & Information center
CIC – Community / Tele Information Center
The model is already in use in Maharashtra.

The **lead partners** will be sharing the following major roles and functions:

1. Anchoring the university
2. Resource mobilization in India & abroad
3. Partnership management
4. Social mobilization strategies and measures for ensuring outcomes.
5. Development of concepts and models of virtual education – R&D in virtual education.
6. Evolving processes & quality measures for granulated object based content development
7. Assessment of VU performance.
8. S/W and H/W development for VU functions.

Four Component Partnership Model giving functions of each component.

Delivery Actuator Service Provider Mostly at local levels	**IT related development, maintenance & Service Provision ICRISAT and COL**	**Content Generation and Service Provision Open Uni. & other providers**	**Promotion, Mobilization and VU Management Lead Partners**
1. Delivery Actuators 2. Activity Service Providers 3. Delivery of material 4. Training services	1. Providing Learning Environment (for courses,activities) 2. Information Hosting along with Data bases	1. Education Service Providers 2. Info Service Providers 3. Domain Expert services and	1. Overall Planning & development strategies. 2. Policies and Advocacy 3. Partnership

for the CLIC functionaries. 5. Local Mobilization 6. Customer paid up-gradation / maintenance services. 7. CLIC / CIC – Facilitation and local services	with s/w provision. 3. Network Management 4. Software Applications for various education /learning activities. 5. S/w Tools Development for farmers for their farms and activity management 6. Web hosting and mirroring info on partner servers.	management 4. Static & dynamic IM MM development 5. Training of functionaries/tutors at CLIC level.	Management 4. Finance 5. Operations overview and management. 6. Training Materials Development 7. Mass-Publicity 8. Mobilization. 9. Actuating delivery 10. Quality Assurance & Authenticati on Management

CLIC is Community Learning and Information Center with minimum infrastructure - Minimum 3 multimedia PCs, Printer, Scanner, Internet Connection and training facilities. CLIC is run by CSP (Community Service Provider) or by local institutions or local entrepreneur

CIC is a Community Information Center with minimum infrastructure - Minimum 1 multimedia PC, Printer, Internet Connection.

- **Approach:**

  - Participation of each partner in a program i.e. course offerings, information supply and activity management could be identified at each level; and sharing of the income could be built on the basis of the contribution made by that partner in each function.
  - Some of the information and content has to be given free for all in order to attract customers to the Network. Each partner will have to contribute to the free information services. Some information can be specialized and add value to the customer /learner output or development and could be charged.
  - The sharing of income amongst all the partners have to be done on some logical and rational basis by considering contribution of each partner. Initially it may be arbitrary. In due course of time it can be perfected on the basis of partner contribution and its usefulness judged by the payment of fees by the learners and users of it.

This is quite a complex task. However a business model and fee-sharing model could be developed.

4. Sources of Revenue Generation

Partnership contribution in kind or money is very essential for developing central facilities such as network, connectivity, software to offer educational environment, quality assurance and various functionalities on network along with central information resources needed by all. The facilities and expertise could be shared by the consortium partners and can become a major factor for success and leadership of the partner in the area of operations.

- **Fees:**

Following income resources are available:

1. Membership fees from users of the courses, information and activities.
2. Tuition Fees for courses and training programs
3. Certification Examination Fees
4. Network Participation Fees from local providers and CLIC & CIC
5. Expert service fee share for personalised /customized and charged services given on the VU network
6. Advertisements

5. State / National Virtual Universities:

It is quite possible that some states / nations may like to establish their own Virtual University to deal with not only the goals, objects and areas of education identified by the VUSAT but also quite more of interest to the people of the state and nation. If the areas of interest are common to some extent, then the State Virtual University may become a partner of the consortium.

Since the coverage of all the region will require covering diversity of languages, agro-climatic zones, stages of development in the region, and above all, local identity and aspirations, it will be appropriate for the VUSAT to promote such a State Virtual University and give it the benefits of the VUSAT.

The model evolved could be adopted for such a Virtual University.

The VUSAT can share with the State VU the following facilities and resources:

a. Network along with connectivity and interactivities.
b. Knowledge Grid with all the region related information and knowledge.
c. Software for educational environment and partnership management.
d. Guidance and leadership in content development, organisation and packaging for learners and learner communities.
e. Common delivery mechanism for access to State VU knowledge and information resources and educational programs from outside the state.
f. Expertise in formulation and establishment of State VU as a virtual organisation working with autonomy and speed of operations.

Maharashtra has already announced its intentions to establish Maharashtra Virtual University for the state. Other states and countries may make similar attempts. They

could be helped by the VUSAT by making them partners in the consortium of the institutions.

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Chapter VII: Content Creation and Research on Virtual Education

Major concern of any university is the quality content to be delivered to the students. Traditional University after developing syllabus or curriculum leaves the content to be taught to teachers. ODE system adopts course team approach and develops Self-Instructional content presented mostly in print form.

The ODE institutions in India have developed during the last 10-15 years quite a vast content in a Self-Instructional Formats and have used audio and Vedio tapes as supplementary learning materials. Radio & TV is also being used for supplementing learning. However, in all ODE institutions, and particularly in Indian ODE universities, print has remained a main story of the content.

The extension departments of state governments and traditional agricultural universities have a lot of content for the use of farmers and villagers in various situations and contexts.

International organizations and educational institutions interested in agricultural related areas will also be having content suitable to the subject areas of interest to VUSAT.
The content creation for VUSAT and its target groups should not start from the beginning, and should rely on the content available with Indian and international educational and other institutions.

1. Criteria for Selecting Content:

- **Accessible and Need-based:**

The content should be **demand driven**, available **in local language**, accessible to the learners and their groups **at local center** with local persons guiding/helping in the learning process.

- **Needs of Stakeholders**

The content should fulfills the needs of Stakeholders:

i. **VUSAT** - Consortium needs in offering courses in the areas identified by the university.
ii. **Farmers' and villagers'** need.
iii. **Hub and CLIC** needs in making their centers self-supporting.

- **Suitability for Various Media and Facilities used for Learning:**

Content should be useful for presentation in the form of multi-media presentations, self-instructional materials in text- book form, distributed or virtual classroom, Radio, TV, Cable TV etc.,

The content could be delivered through CD ROM, study texts, talks, Questions and answers, On-line consultation with experts / teachers, Web based content, Audio and video, etc

Advantage in using in multiple media is that the university reliance on one medium is substantially reduced, learning is enhanced and group learning is promoted as many of the media facilities in Indian context will be available at the CLIC.

2. VUSAT Content:

In general the content could be created, adopted or adapted. The richness of the content on the university network will attract learners as well as partners at local levels to actually deliver content

ICRISAT and other partner institutions forming consortium have rich content; and many are offering the content to learners, farmers and village community in variety of ways.

The knowledge resources and expertise available with partner institutions could be used for developing courses and content in the following areas suitable for the themes identified by the VUSAT.

- **Content Areas:**

Educational:

i. **Literacy** related to weather, water and information technology
ii. Global Themes: Courses related to ICRISAT functions and research activities.
iii. Global Themes courses adopted from open and other universities.
iv. Other agriculture and rural development related courses & activities form partner institutions.

Informational:

i. Content related to local interests for higher productivity, cost-efficiency and marketability at local, regional / national and international markets.

Involvement of the partners as ESP / ISP / ASP with inclusive policy may help us in generating extensive content suitable for VUSAT and other stakeholders.

Making Content Dynamic & Demand Driven

The content development in multi-media self-instructional formats always takes long time and needs heavy resources.

For making content dynamic we may adopt various strategies:

i. **Interactivity-based content-** Make interactivities between experts/teachers and learners in textual and voice forms as an integral component of the content after due changes.

ii **Student created content**- Learner presentations, local content created by learners communities after due editing should be made a part of the content.

iii **Seminar / workshop based content**- Outcomes of seminars, workshops, lectures etc should be a part of content.

The Course Team of the I SP should be entrusted the responsibility of dynamically changing and reforming the course content after every offering of the course and even to change it continually to suit changing needs and requirement of the learners and learner groups.

The responsibility of making course content dynamic and ever changing according to the needs should be entrusted to the I SP

This will need highly flexible and systematically designed content management and developed database system, stored at one or many hubs accessible to any learner having access to the network.

At the back of this activity, we may need at the VUSAT a **Design Team of instructional designers, visualiser and IT experts** who will be able to design content, granulated and otherwise, to make it accessible to learners and learning groups conveniently

- **Content Creation for Literacy and Global Themes:**

Creation in the SIM format is time taking and resource intensive. Hence following steps could be followed.

i. Identify the existing content
ii. Design course curricular with objects associated with each part - course, section, block, and units- of it.
iii. Develop /adopt/adapt course content to suit the curricular design of the course.
iv. Prepare expert / teacher panel for offering on-line services to students, teachers/tutors, groups of learners.
v. Package content in a systematic way in small units which may help the process of granulation.

This stage of development could be the first stage for preparing granualted object based content.

3. Granulation of Content:

Granulated object based content is a great vision of the new paradigm in **organizing and packaging content.** This new concept and vision needs to be well defined and operationalised so as to use it for granulation of the content of any course, and make the content accessible to learners through databases for personalised use.

The Virtual University can develop **granulated object based content** by

- Developing a methodology for granulation,

- Developing software that can manage content databases by allowing inclusion of dynamically changing content expressed in different media of communication and at various levels.
- Storing the content in VUSAT Data-base system and making it accessible to learners over the university network .

- **Following operational stages are proposed:**

i. Develop curricular design with well-defined objects by defining methods of learning and evaluation of the objects
Usually a course in an educational program of an Open University is divided as:

Program ⟹ Blocks ⟹ Units / chapter ⟹ Sub-units / topics.

Each course / unit is assigned credit-point.

ii. As a practical step we propose that the content be developed /created as a SIM by using text, images, audio and video. This is done by a Course-Team as in open universities.

A Design Team could make granulation of the content by giving the content granule all the necessary contextual and pedagogic parameters. The granule should be characterized in such a way that it can be transported and combined in different course contexts. Development of such a scheme is a challenging task and could be taken up in partnership with COL.

iii. A **personalised instructional design system software** be developed and be made available to teachers and students so that they can use it for personalised learning.

- **Recommendations for Granulated Content Creation:**

General:

i. Perceived and felt needs of the target groups be identified.
ii. Available content be studied for adoption and adaptation.
iii. In case of non-availability, suitable content be created.
iv. Curriculum design be prepared. It should include mechanism making content dynamic and should provide for functionality (applications of content in local situations to address and solve local issues and problems)
v. The content offering should be organized so as to allow seamless learning.
vi. Content should include functionality development as an integral part of the content and its delivery.
vii. Evaluation processes and measures should be linked with successful functional achievements.
viii. Partner institutions be involved as ESP / IXP / ASP.

The content should be organized in terms of objects to be achieved, and should be measured in terms of skills, competency and functionality development. The smallest unit of learning should be a **granule or unit of a block**, each having a definite object so that a learner or their group can combine granules / units in a convenient and useful way in their study.

The university should adopt inclusive policy in partnering, and should adopt their programs by avoiding unnecessary duplication. The VUSAT should promote decentralization, non-exploitative and healthy competition particularly at the third level partnership.

The university should have well-defined and organized content of about 500 learning hours in the beginning, out of which at least of 100 hours of study materials should be ready at the time of launch.

4. Research in Virtual Education:

Virtual University is an organisation of the Information / Knowledge Based Society. It is virtual in nature and caters to the learning and knowledge needs of the Informational Age.

Any research in area related to a great transition has to be linked with many issues and concerns of the community and its development in the emerging society.

In general, research will be concerned with all the defining features of the Virtual University, which are the components / processes of making the Knowledge society.

The research will be linked with the issues associated with:

1. **IT enabled processes of teaching, learning and evaluation** for effectively increasing efficiency, relevance and coverage of the processes.
2. Study of the **processes of content creation, organisation and customized delivery** of content

In order to make content offerings rich and useful to the learners and their communities following measures are proposed for immediate use:

In the initial phase for implementing programs in three states we will need content in bilingual form (English and local language)

- **Minimum Essential Measures for Conducting Content Research:**

For Identifying Content and Content Providers:

1. Survey existing mass based courses and their success and limitations in Indian context.
2. Assess needs of the targets groups, particularly the rural communities, self-help groups and their organizations etc., for sustainable growth and development.
3. Identify the nature of agencies / institutions / organizations and their strengths and corresponding brand quality for being suitable as the virtual university partners.

4 Consider already existing courses and programs of the open universities and other education providers so as to adopt adapt them for VUSAT

Research needs to be carried out for:

- Needs Assessment and Content Required by Farmers, Farm and Rural Communities
- Content and services essential for self-sustainability for Mandal Hub and CLICs.
- Means, programs and agencies that can subsidize partly the establishment and operations cost of the infrastructure at Mandal level.
- Ways and means of subsidizing use of facility and services by poor and deprived sections of the village community
- Content development for seamless and life-long-learning- methods and mechanisms for granulation of content. •

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Chapter VIII: Core Administrative Setup VUSAT

1. Administrative Mechanism of the Virtual University:

To carry out the functions, VUSAT should have following functional Units / Divisions:

1. University Management of Development and Operations.
2. Network Management.
3. Content Management.
4. Delivery Management.
5. Research and Development Management.
6. Socio- Economic Mobilization Management.

The functions are grouped under the six divisions in such a way as to include core activities proposed by the COL Model.

During the initial period of two years the work of six divisions could be combined and managed by four units responsible for:

a. University Management.
b. Network Management.
c. Content and R & D Management.
d. Delivery and Socio- Economic Mobilization Management.

The divisions could be separated as the volume of work increases and need for separate management arises.

- **Functions of the Divisions:**

1. University Management of Development and Operations.

This will be the main administrative and management function for managing and coordinating all the developmental and operational activities of the VUSAT. It will work directly under the academic and administrative head of the VUSAT.

Specifically the functions are:

i. Overall strategies and planning for development and operations.
ii. Partnership Management.
iii. Policy formulation and advocacy.
iv. Finance.
v. Total Operations Management.
vi. Total Quality Assurance.
vii. National and International Cooperation and Support.

2. Network Management

The division has the responsibility of employing the latest ICT for networking and communicating and for establishing suitable network access facilities at the Mandal level, which ultimately reaches every village community.

- **Specific functions:**

i. Network establishment and induction of latest ICT development.
ii. Network Management.
iii. Educational Environment development & management
iv. Development of software for networking, educating and learning.
v. Linkages with networks of partner institutions and organizations.
vi. Management of e-content, e-services and e-feedback mechanisms.

3. Content Management:

This division is responsible for assessing the needs of the identified target groups, finding the best and suitable partner institutions/organizations as ESPs, offering educational courses (learning materials and services) with high quality and brand name, development and academic delivery of content, etc. It will also ensure organization of content in granular object related format suitable for seamless and Life Long Learning(L3), and for ensuring learner autonomy.

- **Specific functions:**

i. Needs assessment.
ii. ESP management.
iii. Development of norms and standards for instructional designs and delivery, and quality norms for educational processes.
iv. Development and management of content database – granulated object related content..
v. Delivery of academic services.
vi. Training of central and local experts, teachers and tutors in working with virtual education.
vii. Evaluation process design and evaluation resources management.
viii. Continuous up-gradation, development and maintenance of the content
ix. Ensuring quality and standards of content and educational services.

4. Delivery Management:

Delivery is being done through convergent e-education, which includes distance education-web based & CD ROM based education- and face-to-face (learning center based) education. The Content Development Division manages academic delivery.

The administrative delivery is the responsibility of this division:

i. Delivery of material products (learning materials such as books, brochures, CDs etc.) and learning services.
ii. Learner Relations Management- management of help-desks.
iii. On-line and off-line formative and summative evaluation services.
iv. Conduct of exams, declaration of results and award of certificates.

v. Training of functionaries working at the operational and local levels.
vi. Feedback and its appropriate use in development, delivery and management.

5. Research and Development Management:

Research will be related to

- **Virtual Education.**

This will essentially be the responsibility of the Virtual University

- **Subject areas related to the climate / draught management.**

Draught and climate are the domain area of interest to ICRISAT and other partner institutions involved in teaching and research in these areas. The respective partner institutions will participate in coordinated research activities on the themes. The areas of research should include the global themes and their effective teaching and training.

This division will carry out research and development activities directly and/or by commissioning it on all the themes and issues related to the fulfillment of the goals and objects of the VU. This division should also be responsible for creating e-knowledge and learning resources and managing information services. It will, therefore, consist of two units:

i. R & D Management.
ii. E-Knowledge and Information Resources & Services Management.

- **Themes for Studies and Research:**

The themes for studies and research should be related to:

i. **Development of abilities of rural communities** for their empowerment management of drought.
ii. **Mobilization and development of learned social infrastructure** for climate management.
iii. **Improving and sustaining farm productivity and livelihood opportunities** among vulnerable communities in times of drought.
iv. **Creating and enhancing information and knowledge flows** among stakeholders on climate management.
v. **Policies approaches** essential for climate management and drought mitigation.
vi. **Minimization of adverse impact of draught** on economy, environment, and society particularly on the vulnerable communities.
vii. **IT accesses and success essential for developing learned social infrastructure** and learning society.

Areas of research in virtual education should be related to the development of the processes and operations of the university in achieving its goals & objects.

6. Socio- Economic Mobilization Management:

The objects and outcomes of the Virtual University are linked with social, economic and cultural development and empowerment of people and their communities. For ensuring this outcome, besides education, the VUSAT will have to promote organization of groups for various interests at the Mandal levels and ensure their

community organization so as to achieve sustainable, self-reliant development that promotes goals of the VUSAT.

The activities of the division will involve working with social, educational and private agencies and organizations, inducting Government, Non-Government & Voluntary Organizations as delivery actuators; and ensuring their support in effective working at the grassroots for achieving university goal.

2. Governance Structure:

In the COL model, Virtual University becomes a virtual organisation managing a consortium of partner institutions to fulfil the goals and objects of the university.

The role of the ICRISAT will be one of the lead partners interested in promoting education and development in the domain areas of ICRISAT. The lead partner should assume the role of integration and leadership in this field and may, if decided, take up a role of a virtual Open University offering education and awards to students.

The ICRISAT should in either case be the anchoring institution.

- **Virtual University Governance**

Virtual University should promote:

i. Consortium of partners for mutual benefits.
ii. State/national VU.
iii. Sharing of facilities, resources and services.
iv. Inclusive policy for enabling participation at Mandal level.
v. Offering leadership support to State VU and partner institutions in their domain areas.
vi. South Asian, African and international support for resources (educational and developmental) and partnerships.

The VUSAT should be an autonomous organisation in all its developments and operations, and should be led by an academic and administrative leader of repute. The core management should consist of a few managers and bare minimum support staff. The VUSAT should operate through electronic network and partners of the consortium.

The structure and functions of VUSAT should not be riddled with committees and bodies for decision making. It should be officer/manager oriented. The responsibility of the team will be to implement the policies and strategic plans approved by the Governing Council. The President / CEO will be supported and advised by the university team of Directors / Managers. The governance used by the ICRISAT and COL in their institutional structures could be adopted in the management of the university. Academic and expert participation could be ensured through Techno-Academic Group.

The VUSAT will have to ensure

1. Academic and expert advise.

2. Participation of partner institutions & stakeholders in policies / strategies and program development and delivery.

This could be ensured through consultative mechanism at two levels.

Academic Participation:
Academic participation and consultation could be ensured through **Techno-Academic Group.** Further expert consultation could be ensured through Techno-Academic Committees formed for each domain of subject areas as and when necessary for the related courses.

Stake holder Participation:
This could be ensured as follows:

1. Lead partners should have permanent membership of the Governing Council.
2. Some main partners could be co-opted to represent the group in the Governing Council.
3. Informal consultation with main partners should be ensured through regular communication and feed back and a few occasional meetings.
4. Each Mandal should have **Mandal Advising Group**, whose suggestions and recommendations should be valuable for taking relevant and useful in development and delivery of programs and policies.

University Act or Rules & Regulations:

1. The university should be registered as a non-profit Trust or Society.
2. The rules & regulations should enable virtual meetings and its record keeping of minutes as an authentic record for all legal purposes. This will need ensuring processes for confirming decisions taken in the video or audio meetings, and the record of minutes from the members of the body.
3. Network based communication should be used for consulting and getting feedbask from stakeholders. All the operations of the VUSAT should be almost paperless should be transparent and visible all the cases where we are concerned with large number of partners and stakeholders. Exception will be the official and financial information and data that can not be shared with all.

3. Virtual University Organization.

The authority structure to support the organization could be as follows:

1. Management Council.
2. Board of Directors.
3. Consultative Techno-Academic Group

The Organisation should consist of officers / Managers:

1. Chairman.
2. President and CEO.
3. Directors / Managers of the Divisions.

To avoid confusion with the ICRISAT nomenclature, different designations could be adopted.

- The Chairman will preside over the meetings of the Governing / Management Council.
- The CEO will be appointed by the Governing Council and will be responsible for development and implementation of the programs of the VU.
- The Management Board will be responsible for policies, strategic planning and allocation of resources and assessment
- The CEO will select and appoint the Directors
- The CEO will preside over the meetings of Board of Directors and Consultative Techno-Academic Group.

The first officers and bodies of the Virtual University will be appointed by ICRISAT and lead partners for a period of 3 - 5 years

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Chapter IX: Self-Sustainability

The Virtual University can become self-sustainable within 3-5 years depending upon the extensive utilization of the infrastructure and environment it creates, richness and relevance of the content and services it offers, economies of scale it achieves and wider applicability of its network and programs.

1. Self-Sustainability:

The concept of sustainability should be considered at two levels:

'Central' – VUSAT and state VU levels; and

'Local' – Mandal level- local hub and CLICs in villages.

The size, programs, activities and resources should be enough to make operation – development & delivery- self-sustainable at both the levels.

Sustainability has to be considered from the point of:

i. **Financial**: Financial Sustainability implies generating enough assured finance so as the make University & Mandal level operations self-supporting.

ii. **Education**: Education Sustainability implies offering enough educational programs and activities that fulfills Mandal level knowledge and developmental need of the Mandal / region.

iii. **ICT**: ICT sustainability implies generating enough IT facilities and local expertise that ensures continuous operations, maintenance, upgradation of IT infrastructure that fulfils all the communication needs of the Mandal people.

iv. **Socio-economical**: Socio-Economical sustainability includes generation of enough activities with participation of people and groups (for learning, working, developing, offering-marketing products and services etc.) so as to make sustained use of infrastructure in the self-directed development of the Mandal community by ensuring equity and justice to all people of the Mandal.

Money generated through various activities is an important indicator of interests of people and business communication and developmental activities generated. However income will not be sufficient to measure completely the sustainability of educational and socio-cultural self-sustainability.

We consider here mainly financial self-sustainability.

- **Financial Self-Sustainability:**

Financial sustainability could be reached within 5 years, if various partners and promotional agencies share initial developmental costs, and contribute to the common developmental facilities used by all.

Following strategies are proposed for self-sustainability.

- **Strategies:**

1. Courses for primary target groups should be operationally self-supporting.
2. Courses for secondary target groups should be generating income to meet the operational and developmental costs.

3. Expert services should be organized, particularly for quality and value additions for the purposes of national and international marketing, and income out of the services be ensured.
4. Funding and support for people oriented programs from the governmental and other developmental agencies be obtained to subsidize the programs.
5. Resource **support from corporate bodies** like Infosys, Reliance, Wipro etc. who are interested in spread of IT in rural areas be obtained to subsidize the mass related programs, particularly in creating infrastructure at the Mandal levels.
6. Ensure linkages of the VUSAT programs with the state developmental schemes so as to ensure subsidy to the village level operations for developing **learned social and accessible ICT infrastructure.**
7. The partner institutions and organizations participating in the consortium should share the costs.
8. Development of e-content is taken as the major activity by the Indian UGC. Partnership with UGC, AICTE, DEC and other funding and promotional agencies could provide for resources for extension oriented content development.

3. Self-Sustainability - Detailed considerations:

Sustainability has to be built into each major function of the Virtual University.

Major Functions:

1. Total Development and Operations Management.
2. Network Development and Management.
3. Content Development Management.
4. Delivery and Socio- Economic Mobilization Management.

Detailed Measures proposed:

1. Network Development and Management:

The model proposed here is that the network will consists of Central Hub located at ICRISAT, State Hubs in each region participating in the programs, and Mandal Hub for a cluster of villages. The Local Hub is to be connected with Community Learning and Information Centers (CLIC) established at each village.

Major costs are involved in establishing networking infrastructure, hardware and software facilities located at the four levels. The sharing of the costs should be as follows:

i. The Central Hub h/w and s/w including s/w for educational environment and total management should be developed, established and managed by the ICRISAT.
ii. The State Agency and / or State OU should establish the State Hub infrastructure.
iii. Local Hub infrastructure should be established by local institution / organization / entrepreneurs.
iv. The CLIC should be established by the village level institutions / NGO / local entrepreneurs.

v. The VU should promote Public – Private – Partnership (PPP) at all places wherever possible. Support should be obtained from State Govt. and local financial bodies and industries for the creation of village and Mandal level IT infrastructure.

vi. A Business Model should be developed for the Mandal level operations so as to make maximum use of IT infrastructure at the local level.

vii. The Virtual University use of the network facilities will alone not make operations self-sustaining. The network should, therefore, be used for all types of educational programs, local marketing and other services, dissemination of info and Govt. services, health services and local IT and IT enabled services to the community around the center.

viii. Existing models developed at various places for local self-sustainability should be studied and sustainable model be evolved.

ix. Self-sustaining size of the local region in terms of population and geographical coverage be identified, so that it can generate enough finance to pay for operations and development cost of the infrastructure. All experiences show that it should be of the size of about 15 000 adult population or 25 000 including children. This will obviously depend on the economic and technology development of the region.

x. Access to disadvantaged sections will have to be given prime importance. By considering their weaknesses and disadvantages, it seems certain that they will not be able to pay for access to the IT facilities. Ways and means of subsidizing the local centers be found to make ICT accessible to poor and weak sections of the society.

xi. Existing networks already having wider coverage and outreach should be enabled to participate in the program with win-win partnership. For this purpose, state and nation wide networks of UGC, IGNOU, State Open Universities, and other networks such as Maharashtra Knowledge Corporation Ltd. (MKCL) and ETH.net in Maharashtra, and similar networks in other states should be enabled to join the VU as partners.

xii. The educational environment and other teaching and learning software could be shared with the state level and local hubs and centers. This should attract some **membership fees** from the users and partners.

2. Granulated Content Development Management:

Initial cost of development of content in the MM format is quite high. Further the content has to fulfil the needs and requirements of the learners and learner communities.

i. We should employ economies of scale, and attract large numbers as clients in case of primary target groups.

ii. The strategy should be to disseminate content to masses practically free and earn out of personalised services provided centrally and locally to learners who can pay for it

iii. The VU should **obtain good quality courses** from the providers of education such as open universities and other providers who have already produced such content. The content should however be put in appropriate standardized formats and its quality should be ensured. Content developers if already are not well known, should be allowed to work as Education Service Provider by

associating a brand institution with it. Appropriate sharing model for revenue generated will enable to share the development cost of the content.

iv. For ensuring affordability of the education to the rural community, the development cost should be obtained from outside funding or recovered from tuition fees charged to the learners from higher-level target groups.

v. In all the content delivery operations, the operational cost has to be self-supporting.

3. Delivery and Socio- Economic Mobilization Management.

i. Delivery Actuators be involved and their economic model for delivery operations be well defined so as to ensure self-supporting nature of delivery.

ii. For reducing learner cost, social and public institutions, and voluntary organizations be involves along with private institutions.

iii. Enough activities of partner institutions be brought on the network so that the work of delivery actuators becomes self-supporting.

4. Total Development and Operations Management.

Initial two-year period will be crucial for the university development in many respect. In a developing country like India, where IT percolation and skills to use ICT for various purposes is yet to be developed, people will not pay for the services enabled through IT. Moreover, paying capacity of common people from rural area is quite poor. It is therefore necessary to support operations and services till people get used to it and find them money saving and value adding.

The first two years of the VUSAT will be spent in developing appropriate processes and operations, training human resources and adopting quality and standardization measured in all the operations, products and services. This is a very important developmental stage and would need initial developmental funding, impact of which will be seen only after a period of one - two years.

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Chapter X: Cost Estimates for First Two Years

During the initial period of two years the work of six administrative units / divisions could be combined and managed by four units. They could be attached to the offices of the Director General and Information Resource Management.

Cost estimates for various developments and operations:

1. University Management:
Cost Factors:

- Authority meetings and record
- Publicity
- CEO office and supporting staff.

2. Network Management:

- **Cost Factors:**
  - Hardware & software- installation,
  - Facilities for interactivities and connectivity
  - Software development which includes Educational Environment (learner, learner content and teaching/learning interactivities management systems, total management and operations system)
  - Maintenance, upgradation and operations.
  - Staff – Network Manager, staff for development and operations.
- **Activities: Network development:**
  - Central Hub – website at ICRISAT.
  - State Hubs in 3-10 states (Initially in Andhra Pradesh, Tamilnadu, Maharashtra)
  - Local / Mandal Hubs covering each covering population of about 25 000 (15 000 adults and other children)
  - Village level access centers – CLICs.

- **Estimated Costs:**
  - The present IRMO should be able to network and manage with additional staff and financial allocations.

3. Content and R & D Management.

- **Cost Factors:**

Staff: Div. Manager,
Instructional designers, Media/graphics specialist, Assembler/technician, IT specialists.

Experts for development of quality norms and standards for various processes, products and services.

Activity support for training, workshops, expert honoraria etc.

- **Activities:**

ICRISAT should create initial content in partnership with lead institutions:

1. 500 hours of study (equivalent to half year of study) materials during first 6 – 12 months.
2. Yearly contribution if of 1000 hours of learning materials in the areas of climate and draught management.

- **Partner Institution Content:**

1. Partner institutions (ESPs) learning materials in agricultural and rural development areas for enriching the content availability to CLICs and Mandal Hubs for becoming self-supporting.
2. Large expert and information support from Info/Activity Service Providers to enrich the local level services to the local learners and communities.
3. Training and development workshops /seminars for course curriculum designs and development, and for granulation of content.

4. Delivery and Socio- Economic Mobilization Management.

- **Cost Factors:**

- Delivery manager and supporting staff.
- Training of
  - Domain experts, teachers and tutors.
  - Functionaries of the hub centers and CLICs at the local level.
  - Training of NGO, GO, other partners and local institutions in mobilization of interest groups and their communities
- Publicity and promotional materials preparation and delivery
- Exams and certification.
- Co-ordination of Research activities.
- Library - Reference materials and learning resource materials for development.

- **Cost Estimates for the operations of the Virtual University during the first two years**

Figures Rs in Lac(100 000)

Sr. No	Division	Staff Salaries	Equipment	Operations	Activity Support	Total
1	Total Development & Management					
	First Year	8	1	10	-	19
	Second Year	8	-	10		18
2	Network management				-	
	First Year	15	300	10		325

	Second Year	15	50	10		75
3	Content Development and R & D					
	First Year	15	2	-	20	37
	Second Year	15	-	-	40	55
4	Delivery & Socio-economic Mobilization Management					
	First Year	6	10	10	10	36
	Second Year	6	10	10	10	36
	Total Costs	88	375	60	80	601

A suggestion:
For reducing costs during the initial period, part of staff salaries, costs of some of the operations and development, library and research and development activity costs could be absorbed or allocated in the regular expenditure of the ICRISAT.

Income Generation:

Factors that can contribute to the income are:

- **Contributions form the lead and main partners** in kind or money.
- **Network Membership fees for facilitation services** (education and management environment provided, interactivity facilities, group meetings & discussion facilities etc
- **Membership fees** from SIGs and other organizations using information and network for their communication.
- **Fees charged to managers of local level** Hub centers and CLICs for giving information, expert services etc., which helps the centers to earn money.
- **Tuition fees** charged to students.
- **Training fees** charged to trainees or to their sponsoring agencies.
- **Expert service charges** for the personalised consultation to farmers, organizations and users of the specialized information.
- **Share of Tuition Fee** for offering education and training courses of partner institutions through the VUSAT network.
- **Promotional Fees / Advertisement** charged to promote on the network programs, products and services from agricultural and other product manufacturers and provides.

- **Guesstimates of Income:**

Following income could be obtained during first two years of operations:

1. **Lead Partner contribution** - Rs. 'X'
2. **Consortium Partnership Fee** from Main Partners
   – Rs. 5-10 lacs each , one time /yearly ---- Rs. 150 L
   (one lac= L = Rs. 100 000:-)
3. **Local / Regional level partners** –

One Mandal - one hub & about 5-10 CLICs	
- Rs. 20 000 - per year.	
- 3-10 Mandals in each states contributing about Rs. 2 L. year .	
Three states participating in the program Rs. 6 L. year	
Total about	Rs. 12 L.
Tuition fee share from about 1000 students @ Rs. 1000 -	
Per students, for three states Rs. 30 L/yr.	Rs. 60 L.
Other income - from expert services, software / interactivity	
And facility use	Rs. 30 L.

Total income during the first two years is about Rs. 2.5 crores + contribution of the lead partners. Half of the cost could be met through the initial resources gathered.

Above estimates are very much on the lower side.

Nearly Rs. one crore will be the yearly income form fees from delivery partners and student fees. Network use cost will be considerably low after its establishment.
Increasing partners and mandals in each state, course offerings, students for courses from each state by a factor of about 10-20 will ensure operational and continuing developmental costs of the VUSAT.

Comments:

- During the first two years the income generation form rural areas will be negligible, but it will increase afterwards.
- Initial cost of establishment of network and interactivity is high, but once the infrastructure gets utilized fully for various educational and developmental purposes, then cost to the university will be less and university activities can generate more income.
- Economies of scale in the use of facilities and services will reduce the unit cost and may generate income to compensate for development and up-gradation costs.

On the whole the VU can become self-supporting in its operational and development cost after initial investment in networking, content and quality of educational products and services.

Chapter XI: Recommendations

Various recommend are given in different chapters. Here we give only major concluding recommendations.

1. The Virtual university is an organisation of the information society and creates new paradigms in education – in creating, preserving, disseminating and extending knowledge to the sustainable development. It will also further the cause of ICRISAT and will offer it a channel for its Global Theme related research and extension. The ICRISAT should therefore take up the anchoring role of this university.
2. The VUSAT should be technology driven in networking, content development, content organisation, content packaging and deliveries so that administration and management cost is substantially low.
3. Consortium model with multi-level and multi-interest partnership be employed.
4. The VUSAT will be self-sustaining within two - five years after establishing network and application software. Its operational cost will also be quite low.
5. First two year period will be essential for establishment of processes, and operations of the university, and for adopting quality measures for products, services and facilities it offers.

Other recommendations are given in the text of various Chapters.

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